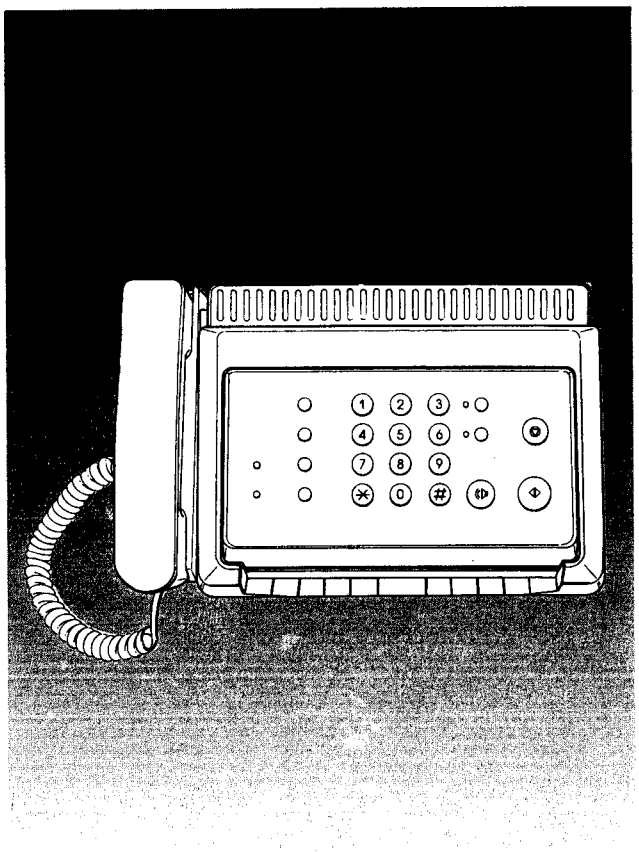
SAMSUNG

FACSIMILE
SF40/30

SERVICE Manual

FACSIMILE



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1. Precautions

1-1. Safety Precautions

1. Before servicing, unplug the power cord to prevent an electric shock.

2. When servicing, observe the original lead dress. If a short circuit is found, replace all parts witch have been overheated or damaged.

3. After servicing, see to it that protective devices such as insulation barriers, insulation paper shields are properly installed and then, be sure to make insulation resistance test to prevent the customer from being exposed to a shock hazard.

1-2. Servicing Precautions

1. Use only manufacturers recommended parts for safety.

2. After removing an electrical assembly equipped with ICs and LSIs, place the assembly on a conductive surface such as aluminum foil to prevent electrostatic change buildup or exposure of the assembly.

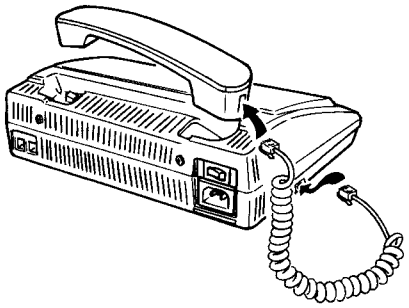
3. Do not grasp IC or LSI pins with bare fingers.

2. Specifications

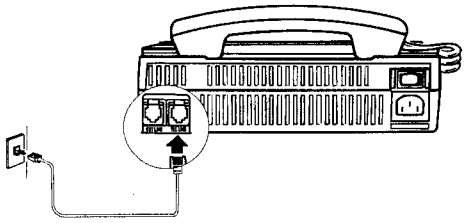
Classification			Specification
Transmitter	Document Size (Width×Length)		Normal : 8.5×11 inches (216mm×297 mm) Max. : 8.5×59 inches Min. : 6×3 inches
	Document Thickness		0.0029 to 0.0059 inches
	Scan Line Length		A4, 1728 scan elements along a line length of 216 mm
	Effective Scanning Width		8.5 inches (216 mm)
	Scanning Method		Horizontal : Flat-bed scanning using CIS Vertical : Intermitted scanning by stepping motor
	Resolution		Fine : 203 pels/inches×196 lines/inches Standard : 203 pels/inches×98 lines/inches
	Transmission Speed		9600/7200/4800/2400 bps
	Coding Scheme		Modified Huffman
Receiver	Recording Paper Size		8.5 inches×49.2 ft
	Effective Recording Width		8.5 inches (216 mm)
	Recording Method		Thermal recording with solid state Thermal Printing Head (TPH)
	Resolution		Fine : 203 pels/inches×196 lines/inches Standard : 203 pels/inches×98 lines/inches
Line Control Block	Communication Facility		Public Switched Telephone Network (PSTN)
	Line Coupling		Direct coupling
	Modem		QAM,DPSK and FSK (V.29, V.27ter with fall back function and V.21)
	Carrier Frequency		1700 Hz (9600/7200 bps) 1800 Hz (4800/2400 bps)
	Control Signal		1100 Hz CNG 2100 Hz CED 300 bps FSK
	Output Level		0 dBm to −15 dBm adjustable by 1 dB step
	Input Sensitivity		0 dBm to −43 dBm
	Input & Output Impedance		600 ohm +/− 30%
Dialing (Telephone)	Dialing Signal		DP/DTMF
	Dialing Method		Direct dialing, Memory dialing, Redialing
	Memory Capacity		10 memory dial (in the power operated state)
Power Supply	Power Requirement		AC 120V, 60 Hz signal phase
Operating Environments	Temperature		50° F to 95° F (10° C - 35° C)
	Relative Humidity		20% to 80% RH (Non-Condensing)
Construction	Dimensions	Width	FX40; 13.27 inches (337mm)/FX30; 10.29 inches (274mm)
		Depth	8.27 inches (210 mm)
		Height	3.15 inches (80 mm)
	Weight	Approx.	: 6.6 lbs (3 Kg)

Note :
Nominal specs represent the design specs. All units should be able to approximate these some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition that still might be considered acceptable; in no case should a unit fail to meet limit specs.

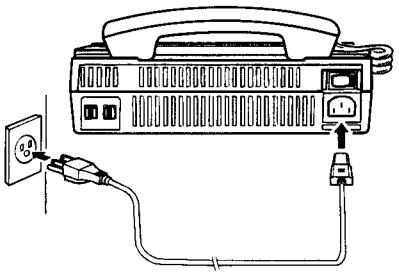
3. Installation



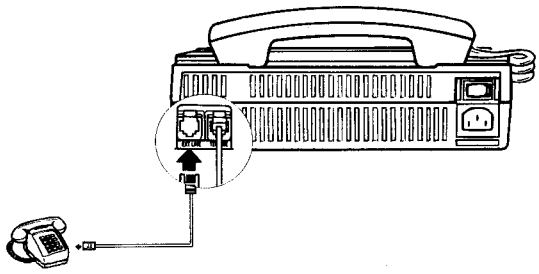
1. Connect one end of the supplied handset cable to the jack on the bottom of the handset. Then, connect the other end of the cable to the **HANDSET** jack on the left side of the unit. After you install the handset, place it in its cradle.



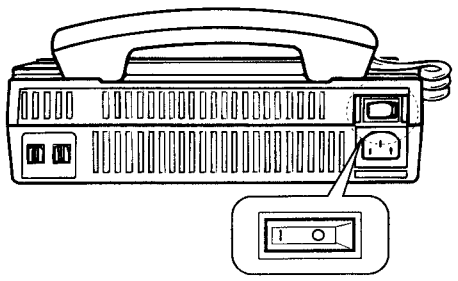
2. Plug one end of the supplied modular cord into the **TEL LINE** jack on the back of the unit. Plug the other end of the cord into a modular telephone line jack.



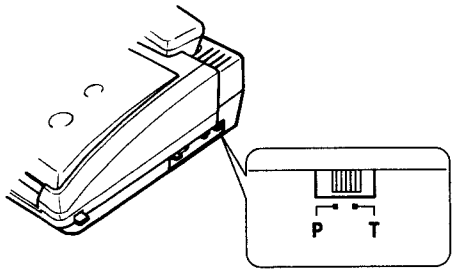
3. Connect one end of the supplied 3-wire, grounded power cable into the receptacle on the back of the fax machine. Then, plug the other end of the cable into a standard, grounded 3-pin AC power outlet.



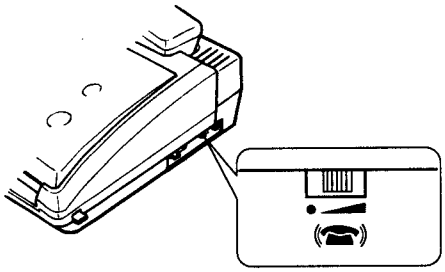
4. Connect an extension telephone or answering machine to your fax machine, if necessary. Plug one end of the modular cord into the **EXT LINE** jack on the back of the fax machine. Then, plug the other end of the cord into a modular jack on a regular telephone you wish to use as an extension or answering machine.



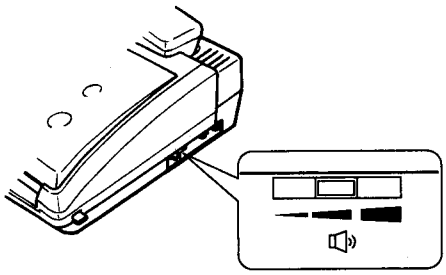
5. Turn on the fax machine by pressing the power switch on the back of the machine. The **POWER/IN-USE** indicator lights.



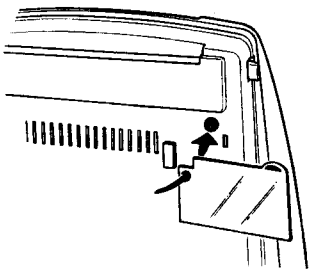
6. The **P/T** (Pulse/Tone) switch on the machine sets the dial type for power fail, or unpowered dialing.



7. You can set the unit for a normal or soft ring. You can also turn a ringer off if you do not want to be disturbed. When you have turned off a ringer, you can still make calls.

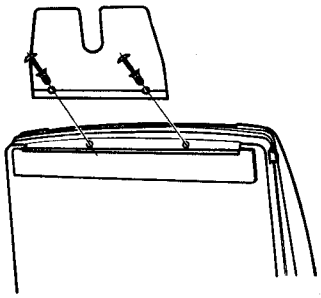


8. This switch controls the sound you hear from the speaker while you are using the **MONITOR** button. Slide it toward the back of your unit to increase the volume, or toward the front of the unit to decrease the volume.



9. Turn the unit upside down and mount a supplied name card.

   Make sure the rivet on the bottom of the unit is stuck into the hole in the name card.

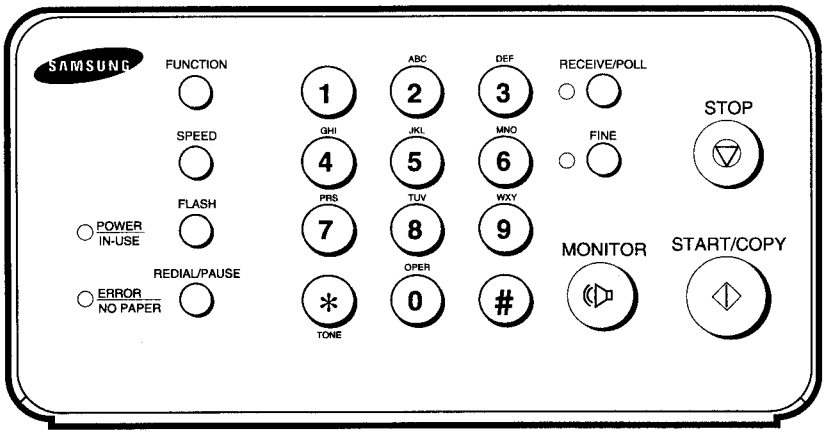


10. If there is not enough space or if you place the unit on the edge of the table, install the supplied guide sheet. Use the snap rivets supplied to mount the guide sheet as shown.

    Note:
    Do not place the unit on the rugged surface or on a thick carpet which might cause jam when you feed a document.

4. Feature and Dimension

4-1. Feature



FUNCTION Button :

Used to set functions.

SPEED Button :

Used to store/recall numbers in the unit's memory.

POWER/IN-USE indicator :

Lights when the unit is on. When the unit is in use, it flickers.

ERROR/NO PAPER indicator :

Lights if something goes wrong with either your machine or the fax communications, or if the recording paper has run out.

FLASH Button :

Used to take a second incoming call on the same line, or to transfer a call behind PABX.

REDIAL/PAUSE Button :

Used to start redialing, or to enter a pause when storing or dialing a telephone number.

TONE Button :

Used to produce touch-tone for tone service.

Dial Keypad :

Used to dial a phone number.

RECEIVE/POLL Button and Indicator :

Used to select proper receiving mode. The indicator will light in automatic receiving mode, flicker in ans/fax mode, and be off in manual receiving mode.

When pressed after dialing telephone number, this button is used to poll a document loaded on the remote fax machines.

FINE Button and Indicator :

Used to improve the clarity of a poorly printed document. The indicator will light when the fine resolution activates

STOP Button :

Used to cancel operation

START/COPY Button :

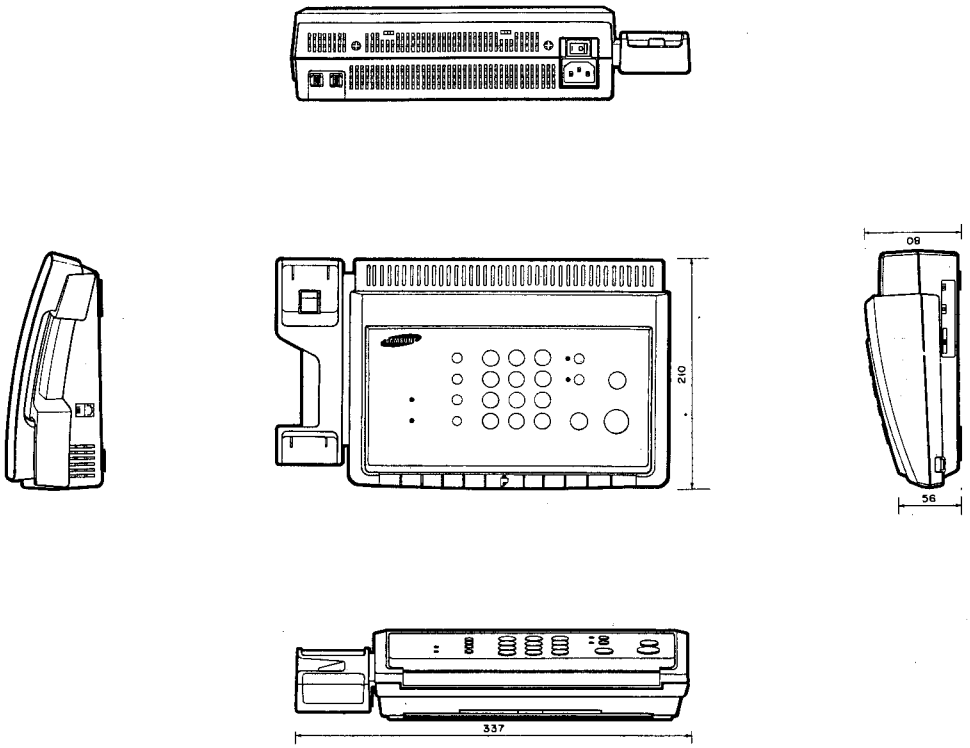
Used to start operation or make copies.

MONITOR Button :

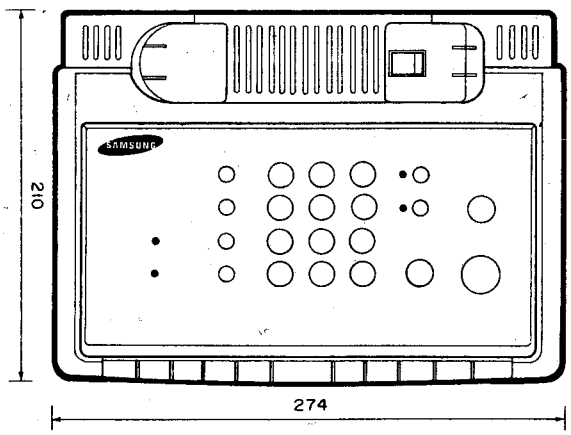
Allows you to dial number without picking up the handset.

4-2. Dimension

4-2-1. FX40/SF40



4-2-2. FX30/SF30



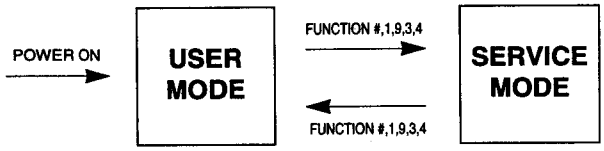
5. Operation Instruction

5-1. Service Mode

The service mode (tech mode) of the machine provides additional option setting,tests, reports, and memory clear.

The service mode is entered by pressing **FUNCTION**, **#**, **1**, **9**, **3**, **4** in sequence.
Then the LED indicators of **POWER**, **RECEIVE**, **FINE** light on and 2 short tone sound then 3-LED lights turn off and indicates the machine is entered in service mode.
The machine will still perform all normal operation and blink the **POWER** LED while in this mode.

You must turn the power switch off and on, or press the key **FUNCTION**, **#**, **1**, **9**, **3**, **4**, in sequence again to return from service mode to user mode. At this time, this operation does not change any option that are changed in service mode, unless doing operation for memory clear tests.



You can communicate with direct connection between both units by pressing the "**MONITOR**" followed by "**START /COPY**" key of the both units.

5-1-1. User Mode Options

Confirmation Report : Default setting → On Error

Whether the machine will print or not the transmission result after every transmission.

On Error = The machine will only print out the transmission result after on error transmission.
Yes = The machine will print out the transmission result after every transmit session.
No = The machine will not print out the transmission result.

Answer On Ring : Default setting → 2 times

The machine can be set from 1 to 7 rings before the fax machine answer a call automatically.

Ext. Phone Transfer to FAX : Default setting → * 9 *

To receive a fax using the extension telephone, fax machine detects the code which is consisted of [*] and one-digit number [9] and [*]. The first and last digit (*) are fixed. You can change the middle-digit number (0 to 9).

Dial type : Default setting → MF Dial

You can select the **TONE** or **PULSE** dial mode for dialing in power on.

0 : MF
1 : DP

Silence Detection Time : Default setting → Unlimited mode

When the fax unit operate with answering machine in **TAD** mode, after a call is picked-up by the answering machine, fax machine monitors line. If a set time treated as a fax message and your fax machine begins reception.

This silence detection time is settable either limited (about 12 seconds) or unlimited time.

5-1-2. Service Mode Options

Silence Drop Out Time : Default setting → 1.7 Seconds

If any signal(tone, voice, fax tone etc.) is detected during silence detection time for the duration of the silence drop out time, the silence time detected previously will be ignored, then restart silence detection.
You can change 0.0 second to 9.9 second(00 to 99).

Modem Speed : Default setting → 9600 bps

Baud rate can be set 9600, 7200, 4800, and 2400 bps. T30 protocol has an affixed speed of 300bps in the protocol mode.
When the Tx. speed is set to 9600 or 7200 bps, the Rx. speed can be any V.29 or V.27ter speed.
When the Tx. speed is set to 4800 or 2400 bps, the Rx. speed can be any V.27ter speed.

Transmission Level : Default Setting → −9 dBm

The FCC says the transmit level should be under −9dBm. −9dBm to −15dBm is acceptable. The machine can be set between 0 and −15dBm with the control panel keypad. The accuracy is +/−1 dBm of the setting.

Monitor Line : Default setting → No

You can hear line signals through a tone speaker. Volume is adjustable with an adjusting lever.

Yes = Monitor the line signal.
No = Speaker active only for dialing, the starting part of the phase B of CCITT, any key tones.

Receive Level : Default setting → −43dBm

Receive level may be lowered due to cable loss.
The machine can be set between −43 ~ −48dBm with the control panel key pad.

Ex1) −43 dBm = Receive sensitivity is between 0 to −43 dBm.
Ex2) −48 dBm = Receive sensitivity is between −5 to −48 dBm.

Cable Equalizer : Default Setting → Long

In copper wire, lower frequencies are attenuated less than higher frequencies.
In the longer the cable, the more pronounced the effect.
To compensate for this effect, the machine should be set to adjust the cable length approximately.

Long = The machine will compensate in the longer the cable.
Short = The machine will compensate in the shorter the cable.

Noise Compensation : Default Setting → No

Setting the modem receiver gain thresholds for noise immunity in high speed data reception.

Yes = Ensuring that the high-speed receiver turns off cleanly if noise is above the nominal turnoff threshold.
No = Normal setting the modem receiver gain thresholds.

Ignore First DIS : Default setting → No

DIS(digital identification echo) or ringing effect is generated in transmitting.
This will be canceled by suppression.

Yes = When originating a call, fax machine will wait until two **DIS** signals are received from the remote unit before responding. When answering a call, fax unit will pause 1.5 seconds between sending **CED** and **DIS**.
No = Normal processing

5-1-3. Options setting Procedure.

- Press the following keys in this order.

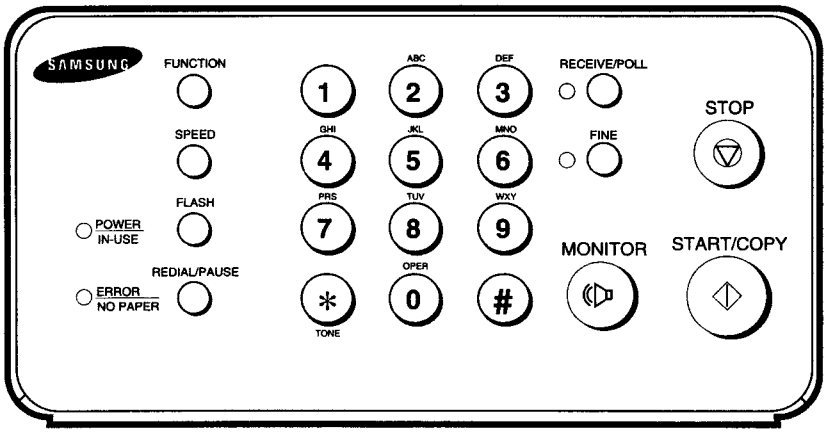
- press the [**FUNCTION**] key
- press the [**3**] key
- press the code keys shown following table.
- press the [**#**] key
- press the selectable data key shown following table
- press the [**START/COPY**] key

You can print out HELP LIST about the procedure.
Press the following keys in this order in user mode or service mode.

- press the [**FUNCTION**] key
- press [**START/COPY**] key.

MODE	CODE	FUNCTIONS	DEFAULT	SELECTABLE DATA
	00	CONFIRMATION REPORT	2	O:NO 1:YES 2:ON ERROR
	01	ANSWER ON RING	2	1:1 TIME ~ 7:7 TIMES
	02	EXT. PHONE TRANSFER TO FAX	* 9 *	0:DTMF 0 ~ 9:DTMF 9
USER	03	DIAL TYPE	0	0:MF 1:DP
	04	SILENCE DETECTION TIME	0	0:UNLIMITED 1:LIMITED
	05	SILENCE DROP OUT TIME	17	00(0.0 sec) ~ 99(9.9 sec)
	06	MODEM SPEED	3	0:2400BPS 1:4800BPS
	07	TRANSMISSION LEVEL		2:7200BPS 3:9600BPS
	08	MONITOR LINE	12	00(0dBm) ~ 15(−15dBm)
	09	RECEIVE LEVEL	0	0:NO 1:YES
TECH	10	CABLE EQUALIZER	43	43:−43dBm 48:−48dBm
	11	NOISE COMPENSATION	1	0:SHORT 1:LONG
	12	IGNORE FIRST DIS	0	0:NO 1:YES

5-2. Operating



5-2-1. Entering Basic Information

1. Setting Data and Time

The date and time setting appear in the top of all transmitted copies along with your ID name and number.

1) Press **FUNCTION**, and **0**.

2) Enter the month, day and year with a 2-digit number. And enter the hour and minute in 24-hour format.

For example, to enter June 1, 1993 at 2:11 P.M., you would type 06 for month, 01 for the day, 93 for the year, 14 for the hour, 11 for the minute.

3) When you finish, press **START/COPY**.

A time report is automatically printed out so that you can check the date and time.

Note:
To cancel the procedure while setting date and time, press **STOP**.
Your unit returns to the stand by mode.

2. Setting Your Terminal ID

Your ID number and name help remote fax machines and operators identify your machine.

1) Press **FUNCTION,** then **1**.

2) Enter the telephone number of your fax machine as described in "How To Enter Terminal ID".

Be sure to press ✱ after each digit you enter.
For example, if you want to enter 1234, press **1 ✱ 2 ✱ 3 ✱ 4 ✱**.
When you finish, press **START/COPY**.

3) Enter your name (company name or business name) as described in "How To Enter Terminal ID".

If you do not want to enter name, press **START/COPY** without entering name.

4) When you finish, press **START/COPY.**

A terminal ID report is automatically printed out so that you can check your ID number and name.

3. How To Enter Terminal ID

Before you set your ID number or name, write down the information. This helps you quickly set the name, and provides an instant reference in case you make a mistake and have to repeat the setting procedure.

1) Press the number key labeled with the number or character you want.

Press it once to obtain the number, twice to obtain the first letter, three times to obtain the second, and four times to obtain the third.
The chart below shows how many times to press each number key to produce a specific character.

To add space between characters, press **REDIAL/PAUSE.**

2) Press ✱ after you enter the desired character to confirm it.

3) Select further characters in the same way.

For example, to enter **MY CO:**
1. Press **6** twice, then ✱.
2. Press **9** four times, then ✱.
3. Press **REDIAL/PAUSE** to insert a space.
4. Press **2** four times, then ✱.
5. Press **6** four times, then ✱.

Keypad	1	2	3	4	5	6	7	8	9	0	#
1st Press	1	2	3	4	5	6	7	8	9	0	#
2nd Press	Q	A	D	G	J	M	P	T	W	+	:
3rd Press	Z	B	E	H	K	N	R	U	X	✱	/
4th Press	–	C	F	I	L	O	S	V	Y	,	.

Notes :
If you make a mistake while entering your number and name, or if you want to cancel the ID setting, press **STOP**. Your unit returns to the standby mode. If necessary, start over again.

You can enter the ID number up to 20 digits and the name up to 40 digits.
If you enter more than the digit numbers, your unit sounds warning beep.
If so, please shorten them and try again with new ones from step 1.

4. Storing Numbers For Speed Dialing

You can store up to 10 telephone numbers in the unit's memory.

1) Press **FUNCTION**, and **SPEED**.

2) Enter one-digit speed number (from 0 to 9) to which you want to assign the telephone number.

3) Enter the telephone number (up to 34 digits) you want to store using the dial keypad.

Include any pause entries or dialing mode changes.

4) Press **START/COPY**.

5) If you want to identify the telephone number with a name, enter the desired name (up to 20 digits).

5-2-2. Sending

1. Sending a Document

Note : You can insert only a single sheet at a time.

1) Place the document face down with the top edge going into the feeder slot.
Make sure that the document is centered on the feeder. Gently insert the document into the slot until the unit beeps. Then the unit pulls in the document automatically. If not, try once again.

2) If the document has small type from a dot matrix printer, press **FINE**. The **FINE** indicator lights.

It allows the fax machine to send the document at a higher resolution.

3) Pick up the handset or press **MONITOR**.

4) Press the number of the remote fax machine using the dial keypad.

You can use speed dialing.

5) When the called fax machine answers, a high pitch tone sounds followed by a warbling tone. When you hear the fax tone, press **START/COPY**.

If someone answers the phone, tell the person to press the **START** button on their machine, and press your **START/COPY** when you hear the fax tone from the remote unit. Replace the handset.

2. Using Speed Dialing

If you have stored frequently used numbers in the unit's memory, and if the remote party you are calling is set to receive documents automatically, you can send a document as follows:

1) Feed the document face down into the unit. Make sure the unit pulls in the document. Adjust the resolution, if necessary.

2) Press **SPEED** and enter one-digit speed number (0-9).

The unit automatically dials the number, confirms the connection, and sends the document.

5-2-3. Receiving

1. Automatic Reception Mode

To set your fax machine to automatically receive documents, press **RECEIVE/POLL** until the indicator lights.

When a call comes in, your fax machine automatically receives the document after two rings.

If you pick up the handset before your unit answers, you can talk to the other party. If the other party wants to send a document to you or if you hear a fax tone, press **START/COPY** and replace the handset. The **POWER/IN -USE** indicator flickers while the fax machine receives the document.

2. Manual Reception Mode

If you often use your fax machine as a regular telephone, select the manual reception mode.
To set your fax machine to the manual reception mode, make sure the **RECEIVE/POLL** indicator is off. If it is lit, press **RECEIVE/POLL** until the indicator is off.

1) When the phone rings, pick up the handset.

If it is a regular phone call, talk as usual. Skip step 2.
If you hear a fax tone, the other party is trying to send a fax. Go to step 2.
If the other party answers, and says he wants to send a fax, go to step 2.

2) Press **START/COPY** and replace the handset.

When your fax machine finishes receiving the document, it sounds a long tone and then automatically returns to the standby mode.

3. ANS/FAX Switching Mode

In **ANS/FAX** mode, the unit can share the same telephone line with an answering machine.
To use this mode, you have to install an answering machine to the **EXT LINE** jack on your fax machine.
To select the **ANS/FAX** mode, press **RECEIVE/POLL** repeatedly until the indicator flickers.

1) When a call is received, the answering machine answers and plays a recorded outgoing message.

2) If a fax tone is detected on the line by your fax machine, the call automatically switches over to the fax machine and reception begins, overriding the answering machine's announcement.

If someone wants to speak with you, your fax machine ignores the call. The caller can leave a message on the answering machine.

Notes:

- If you have trouble receiving faxes in the **ANS/FAX** mode, change the silence detection time mode. This feature in the "User Options" will ensure fax reception when a fax tone is not detected on the line by your fax machine.

- When only fax messages are received your answering machine may still indicate a voice message has been left even though none was actually received.

- If the sound level of the incoming call is too low due to a poor telephone connection, the fax machine and/or answering machine may not function properly.

- If the answering machine does not answer the call for such reasons that recording message is full or the answering machine is switched off, your fax unit will automatically receive the fax. If the answering machine is featured with a user-selectable ring counter, set the machine to answer an incoming call within 4 rings or less.

- When you use using the manual reception mode on your unit and an answering machine is installed, you must make sure you switch off the answering machine, otherwise the **OGM** from the answering machine will disrupt your telephone conversation.

- When your answering machine answers an incoming call, a fax tone may be recorded while your fax discriminates between a voice and fax. Your answering machine may indicate a voice message has been left.

- Set your answering machine to **VOX** mode (if applicable). **VOX** stands for voice operated transmission and is the name given to the answering machine facility which causes disconnection when a period of silence is detected by the answering machine. So, if the silence is detected, your fax machine begins fax reception.

Some Message Guideline

The message that you record on your answering machine should give clear instructions to callers who may want to send a fax or leave a message. Your message should say "This is (your company). If you would like to send a fax, please press your **START** key. If you want to leave a message, please speak after beep."

Keep your message as short as possible.

4. General Notes on Receiving

The thermal paper used in your fax machine is sensitive to heat and sunlight, and fades after an extended period of time. If you need to keep the faxed document for a long time. We suggest you make a photocopy of it.

If a communication error occurs, the fax machine sounds a long warning tone and the **ERROR/NO PAPER** indicator lights.

When you are out of paper, the **ERROR/NO PAPER** indicator lights to let you know. Replace the recording paper.

5. Receiving Using an Extension Telephone

If an extension telephone is connected to the **EXT LINE** jack on your machine, you can transfer a fax transmission to your fax unit using the extension telephone.

Note:
If you have pulse service, set the extension telephone to the tone position to use this feature.

1) Make a call or receive a call on the extension telephone. Speak with the person on the other end of the line.

If a fax tone is heard when you pick up the handset, go to step 3.

2) To receive a fax on the same call after the conversation, ask the remote operator to press his/her **START** key.

3) When a fax tone is heard press ✱, **9**, ✱ in sequence on the extension telephone.

Note:
You can change the code (✱ 9 ✱).
If you still have the fax tone from the remote machine, press ✱, **9**, ✱ once again.

4) The call is transferred to your fax machine and reception begins.

The extension telephone is disconnected automatically. Hang up the handset.

6. Simple Polling

Polling allows your unit to receive a document from an unattended remote fax machine. The remote party with the original document must make sure that it is properly fed into their fax machine so that you can poll it.

1) Make a call to the remote fax machine you want to poll.

2) Press **RECEIVE/POLL** the remote fax machine answers with a fax tone.

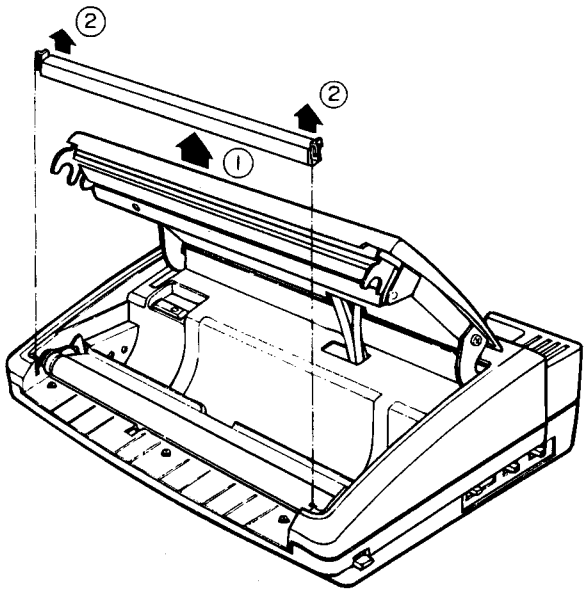
Your unit begins receiving the document. Hang up the phone.

Notes:
- When polling another fax unit to retrieve a document, if the remote unit is secured with a poll code, you cannot receive the document.
- Not all fax machines have polling capability, and polling incompatibility sometimes occur between fax machines from different manufacturers, so polling may fail in some cases, even when poll codes are not used.
- Your fax machine cannot be polled. So, other fax machines cannot poll a document from your machine.

6. Disassembly Instructions

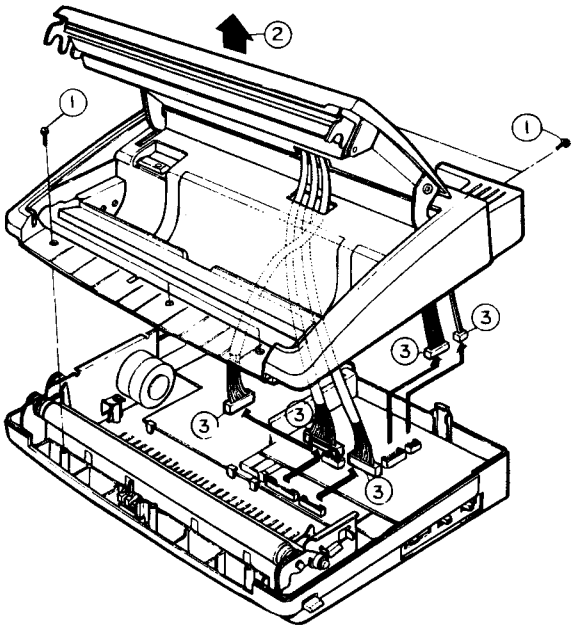
6-1. Removing the Tx-Guide from the Unit

1. Open the OPE panel (operation panel) assembly.
2. Remove the Tx-Guide to the indicated direction carefully as shown below.



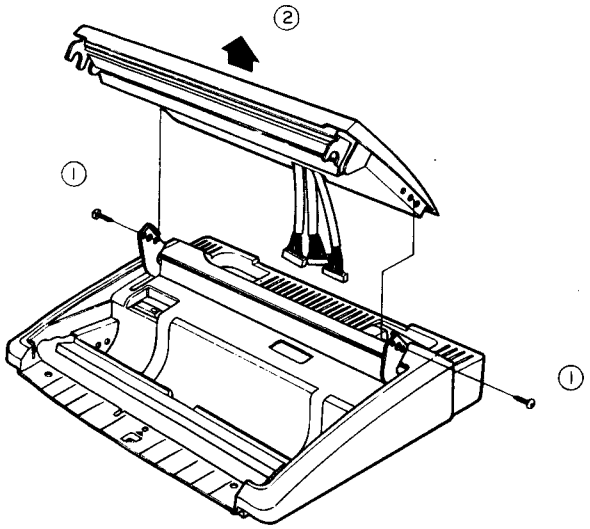
6-2. Removing the Top-Cover from Base

1. Loosen the screws fastening the top-cover.(5 screws)
2. Lift up the top-cover carefully by hands.
3. Remove the harness from the base.



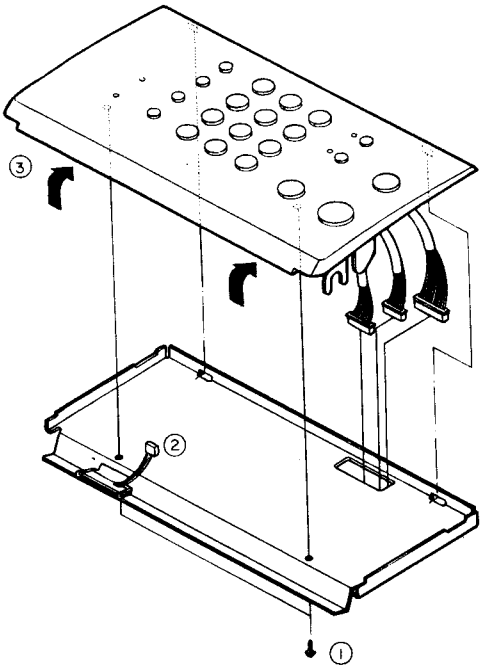
6-3. Removing the OPE Assembly from Top-Cover

1. Loosen the screws fastening the top-cover.(2 Screws)
2. Lift up the OPE assembly carefully as shown below.



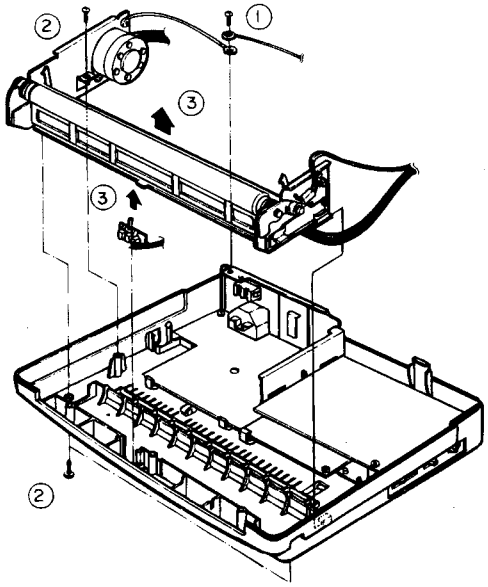
6-4. Removing OPE unit from the OPE chassis

1. Loosen the screws fastening the OPE chassis.
   (2 Screws)
2. Removing the paper empty sensor connector from the OPE board.
3. Removing the OPE unit from the OPE chassis as shown below.



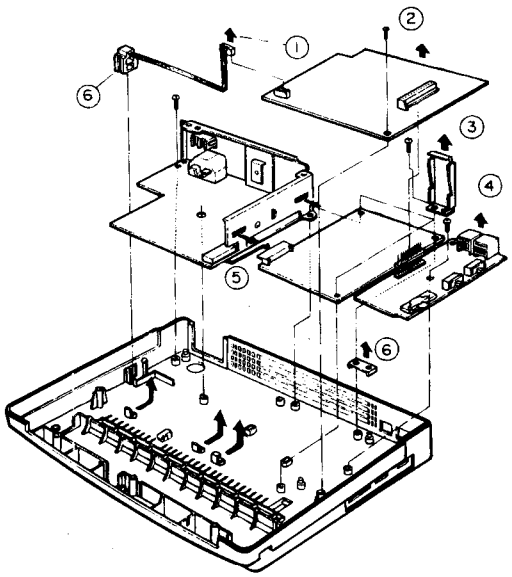
6-5. Removing the Main chassis from the Base

1. Loosen the screw fastening the power and ground harness.
2. Loosen the screws fastening the main chassis assembly. (3 screws)
3. Lift up the main chassis assembly and D.DET sensor.

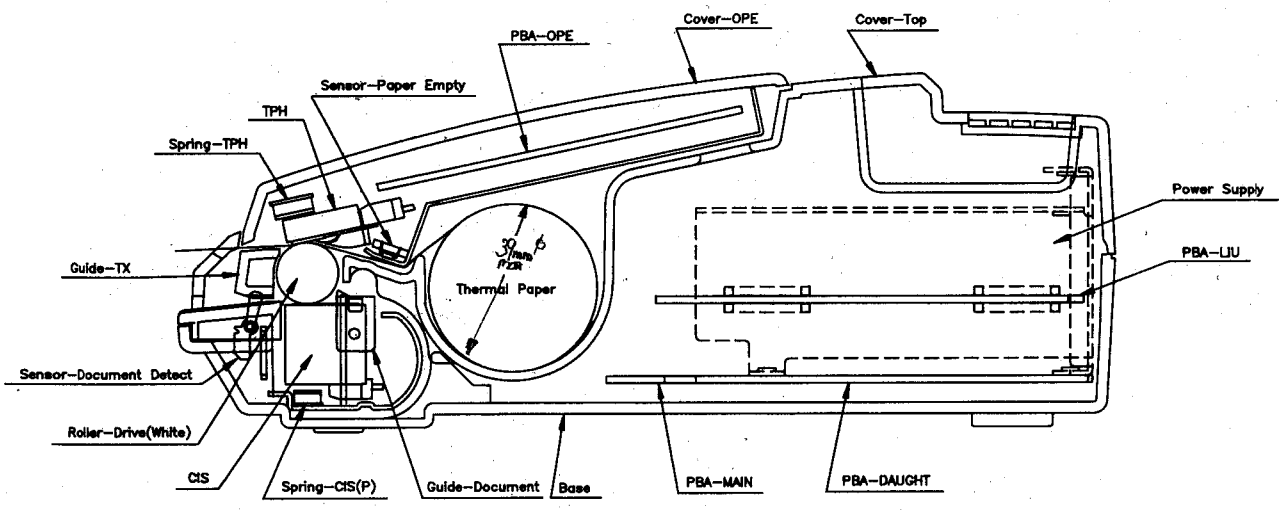


6-6. Removing the Power and Boards from the Base.

1. Removing the handset modular harness from LIU board.
2. Loosen the screw fastening the LIU board and lift up the LIU board carefully as shown below.
3. Loosen the screws fastening the main & daughter board.
   (3 Screws)
   Lift up the bracket-rear.
4. Loosen the screw fastening the base & daughter board.
   (1 Screw)
   Lift up the daughter board.
5. Loosen the screws fastening the power and base.
   (2 Screws)
   Lift up the power & main board and remove it.
6. Lift up the modular jack and spring-earth.



7. Maintenance



15m kleiner (1/2") Kern
15m großer (1") Kern paßt nicht!

Position	Check Point	Remarks
Document Path	Remove any foreign matter such as paper.	
Roller	If the roller is dirty, clean it with isopropyl alcohol and then, dry thoroughly.	
Thermal Print Head (**TPH**)	If the TPH is dirty, clean the printing surface with isopropyl alcohol, and then, dry thoroughly.	
Contact Image Sensor (**CIS**)	If the scanning glass of is dirty, clean the glass with a dry soft cloth.	
Sensor & Switch	Document detect sensor Paper empty sensor	
Abnormal Wear Loosened parts	Exchange the part. Check the tightness of screws on each parts.	

8. Troubleshooting

Chart 1 Overall Troubleshooting

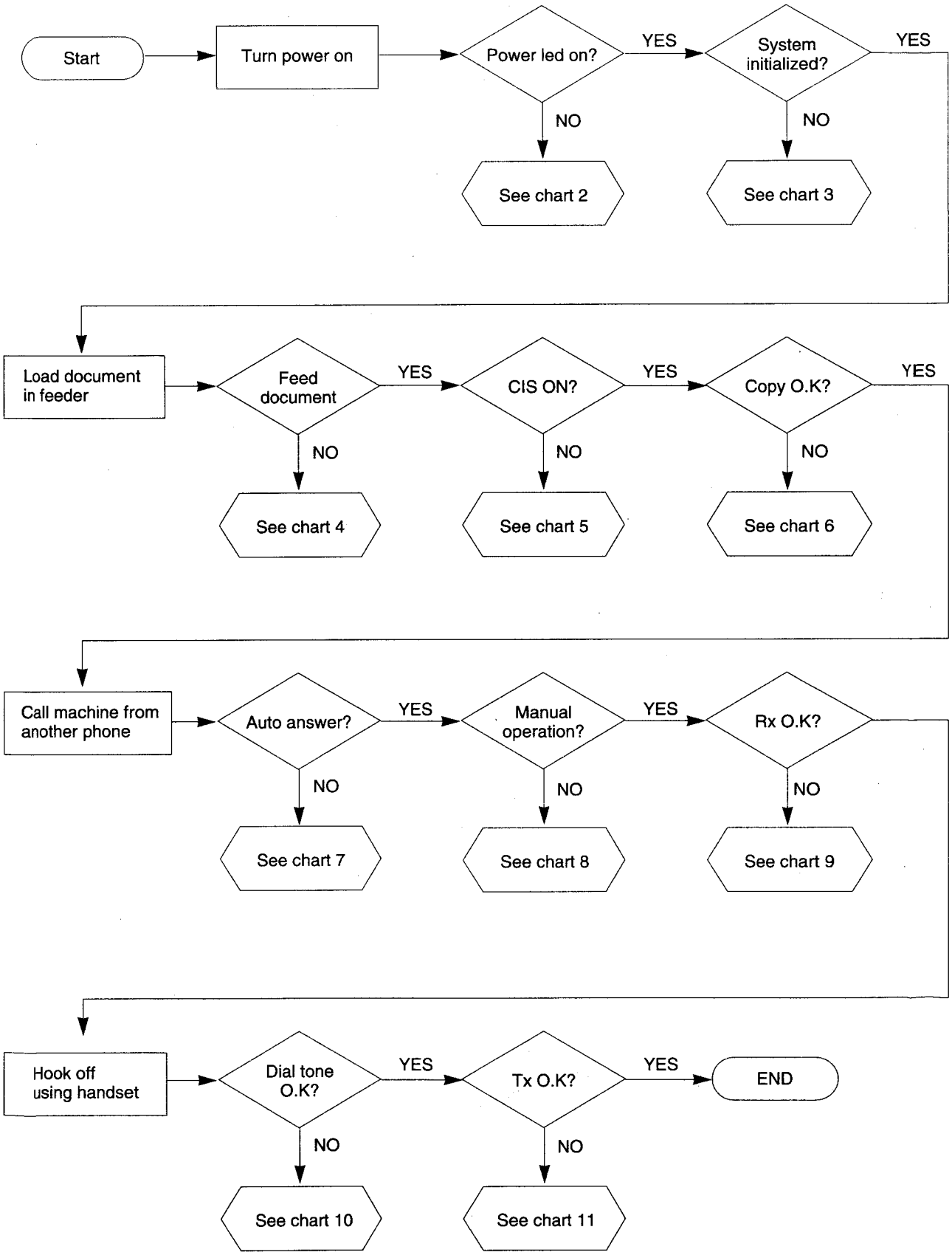


Chart 2 Continued

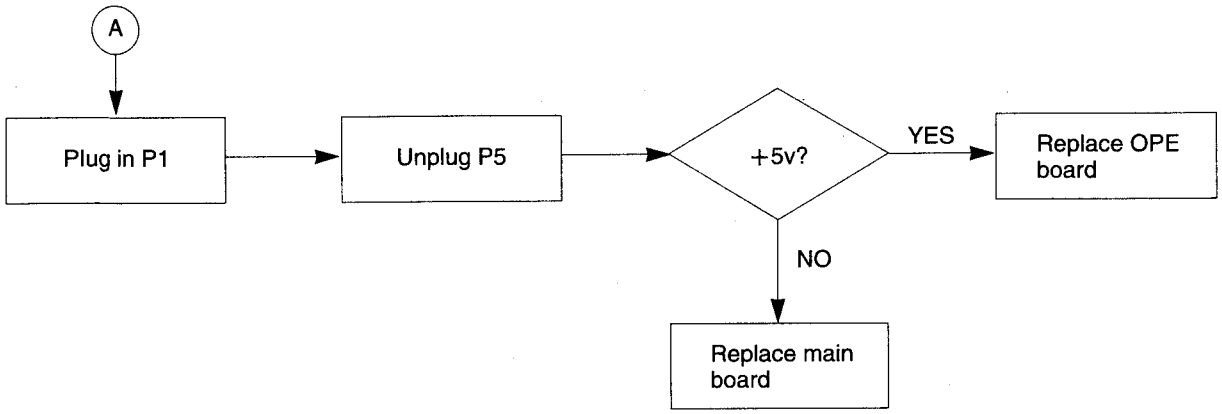


Chart 3 System Not Initialized

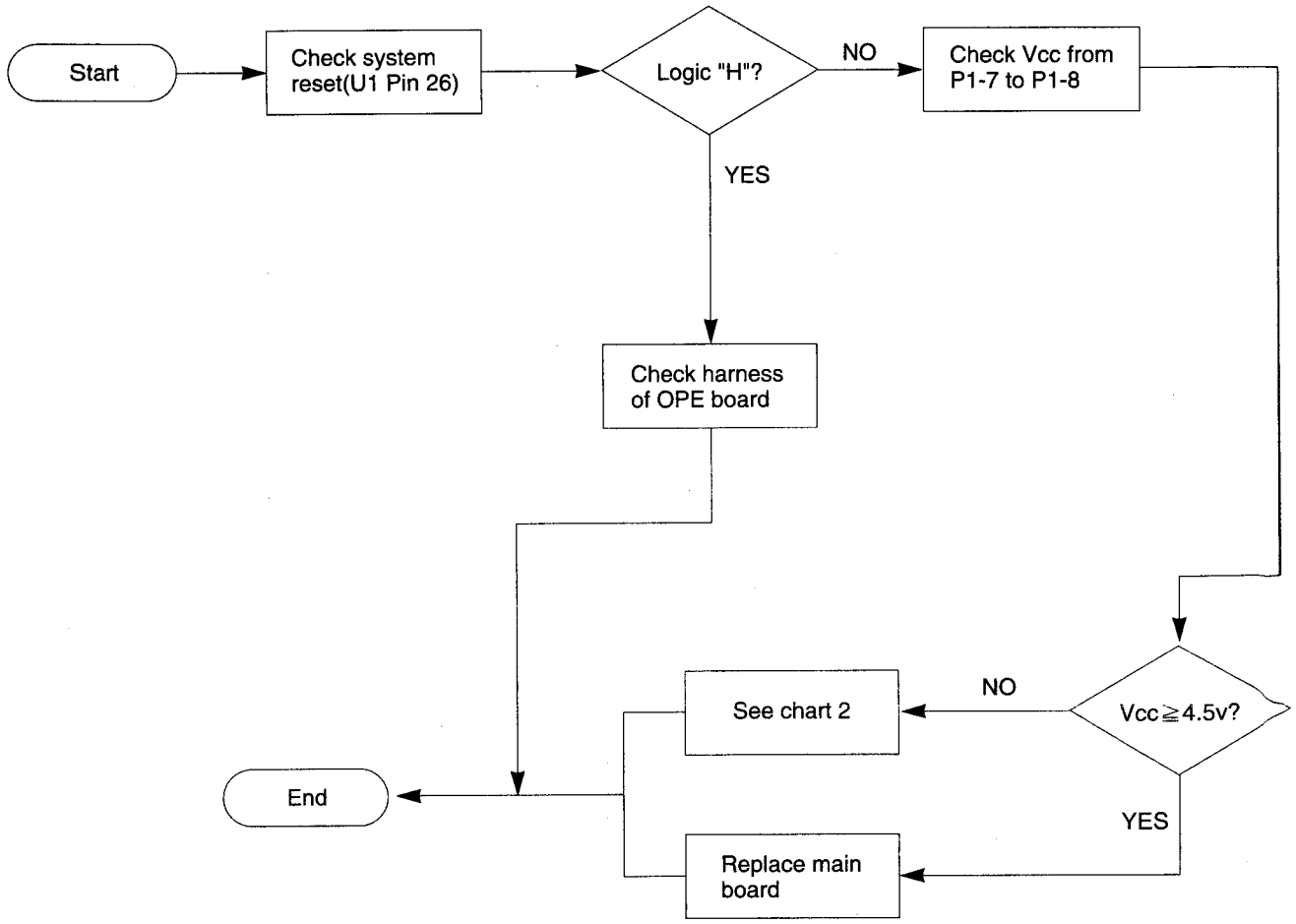


Chart 4 Document Not Feed

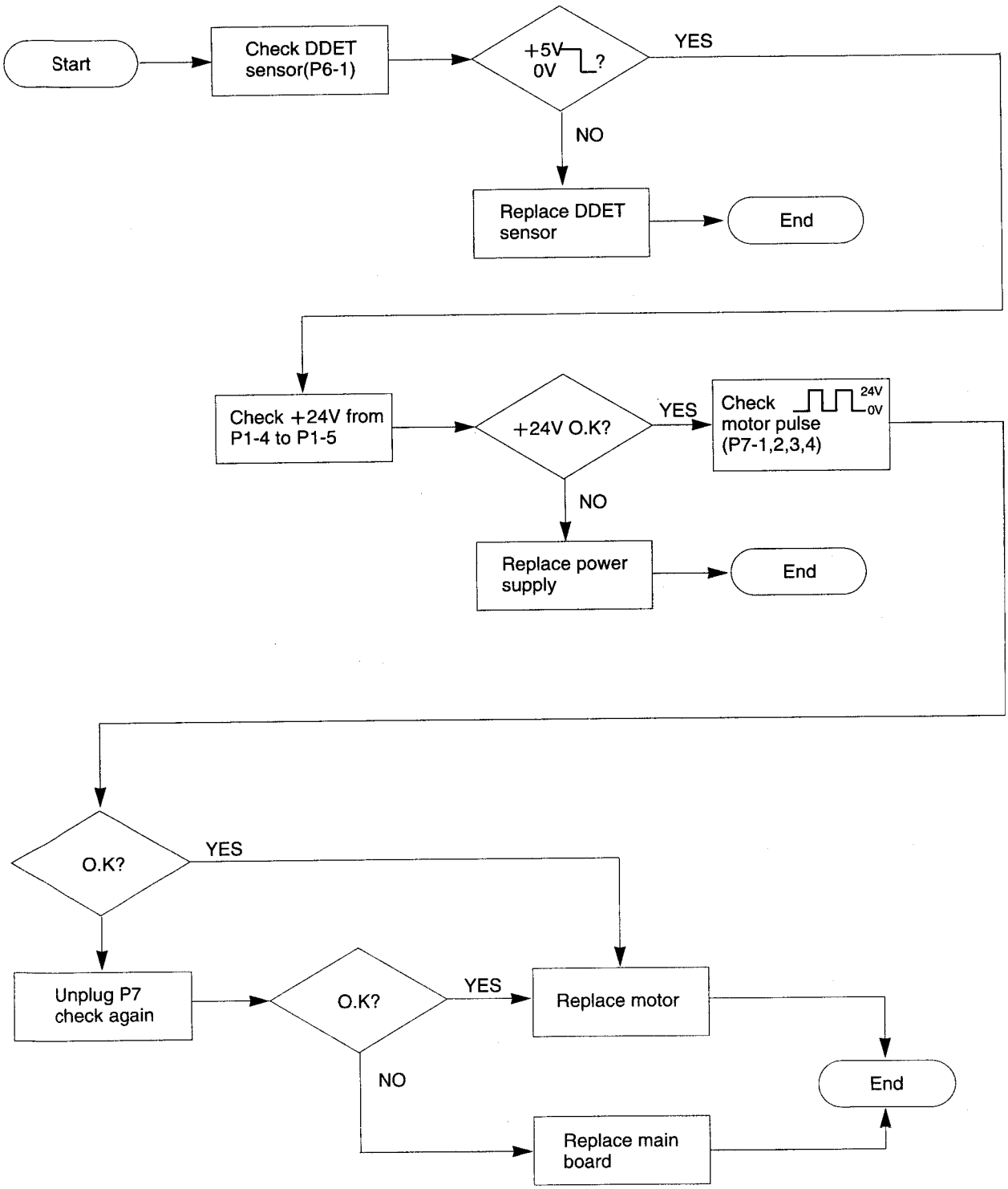


Chart 5 CIS LED Not LIT

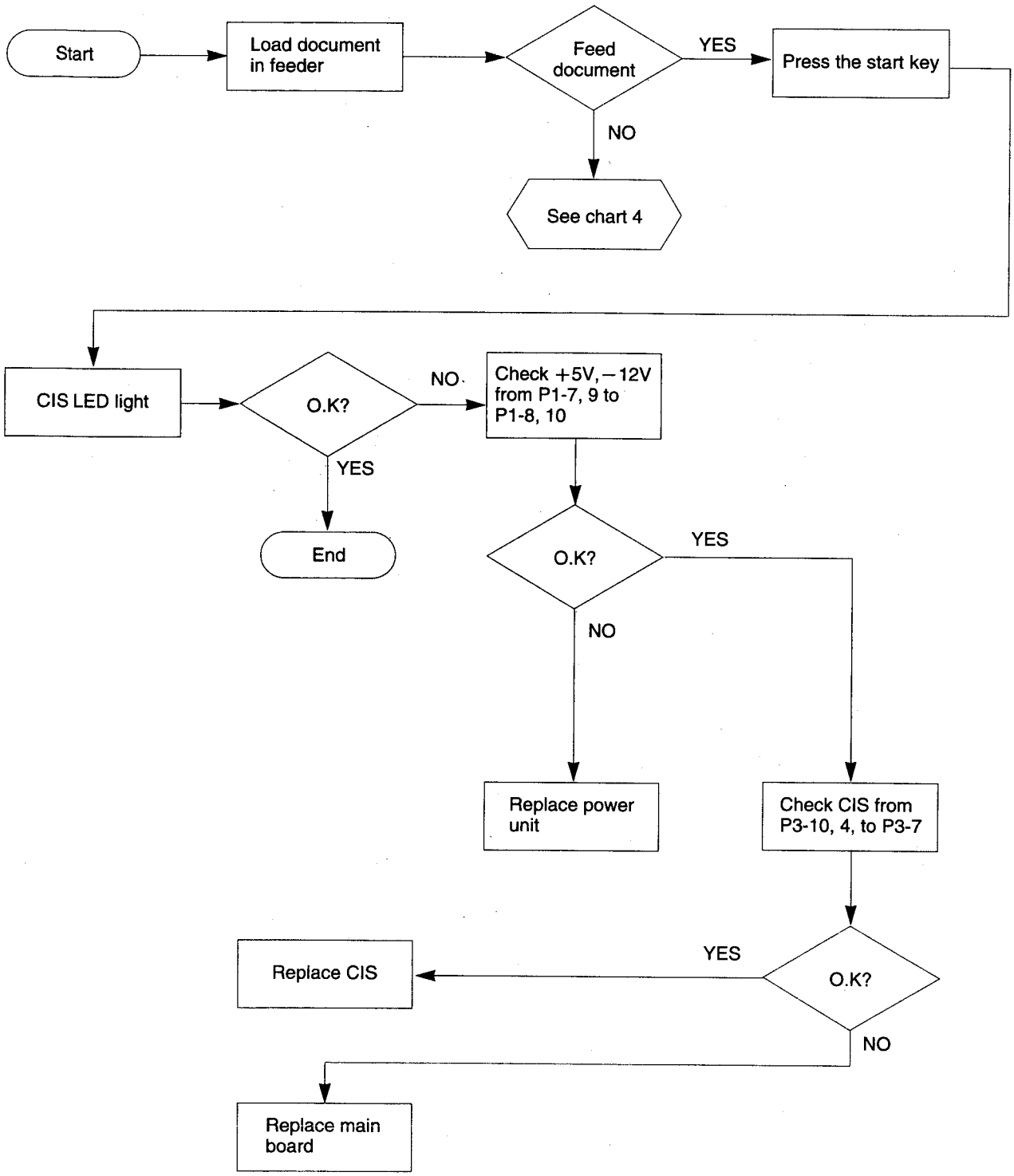


Chart 6 No Copy Mode Operation

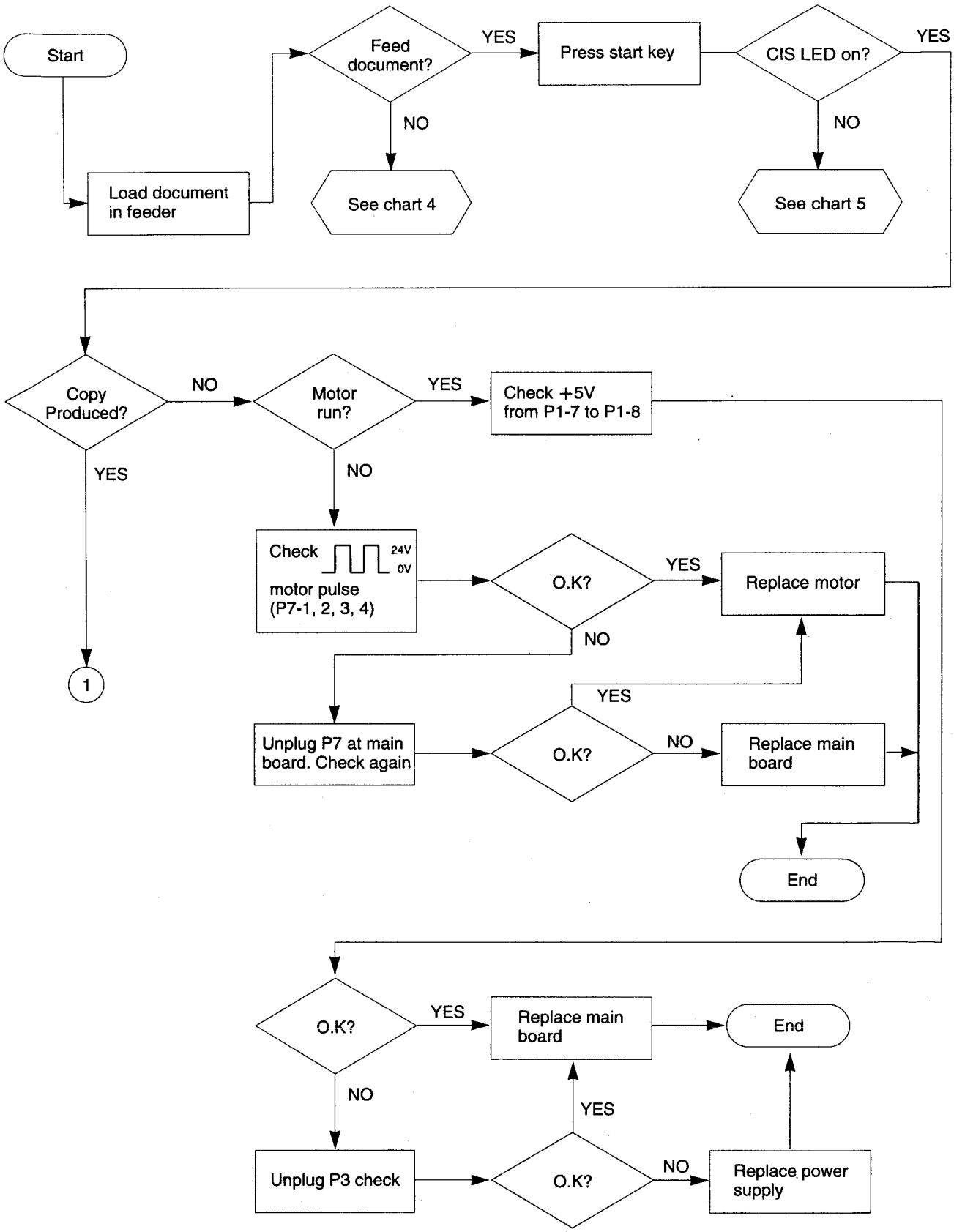


Chart 6 Continued

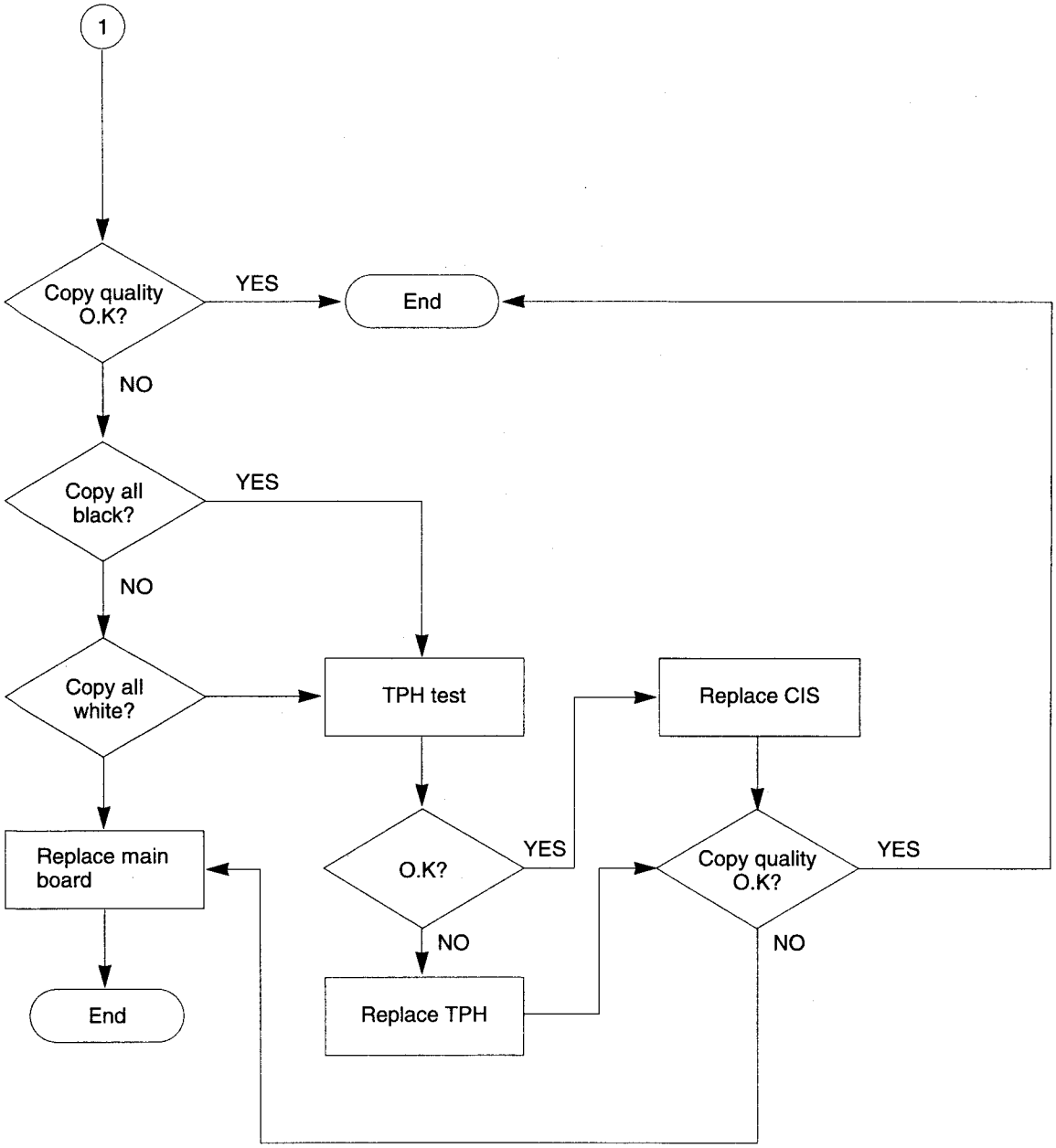
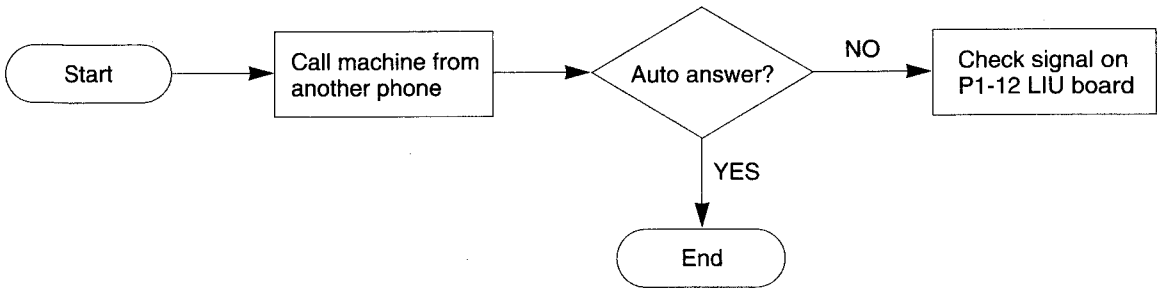


Chart 7 Auto Answer Problem



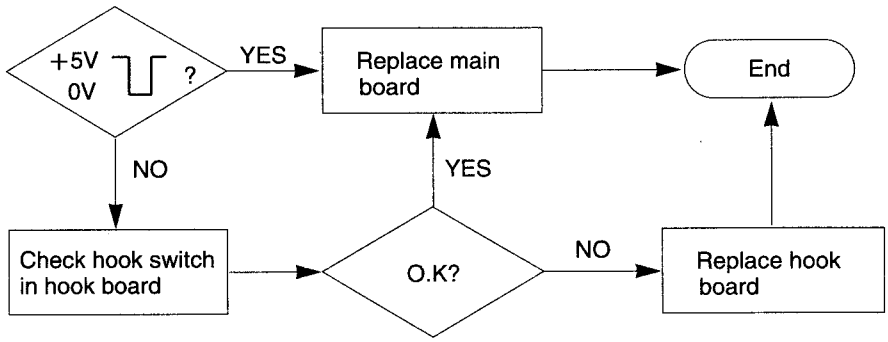


Chart 8 Manual Operation Problem

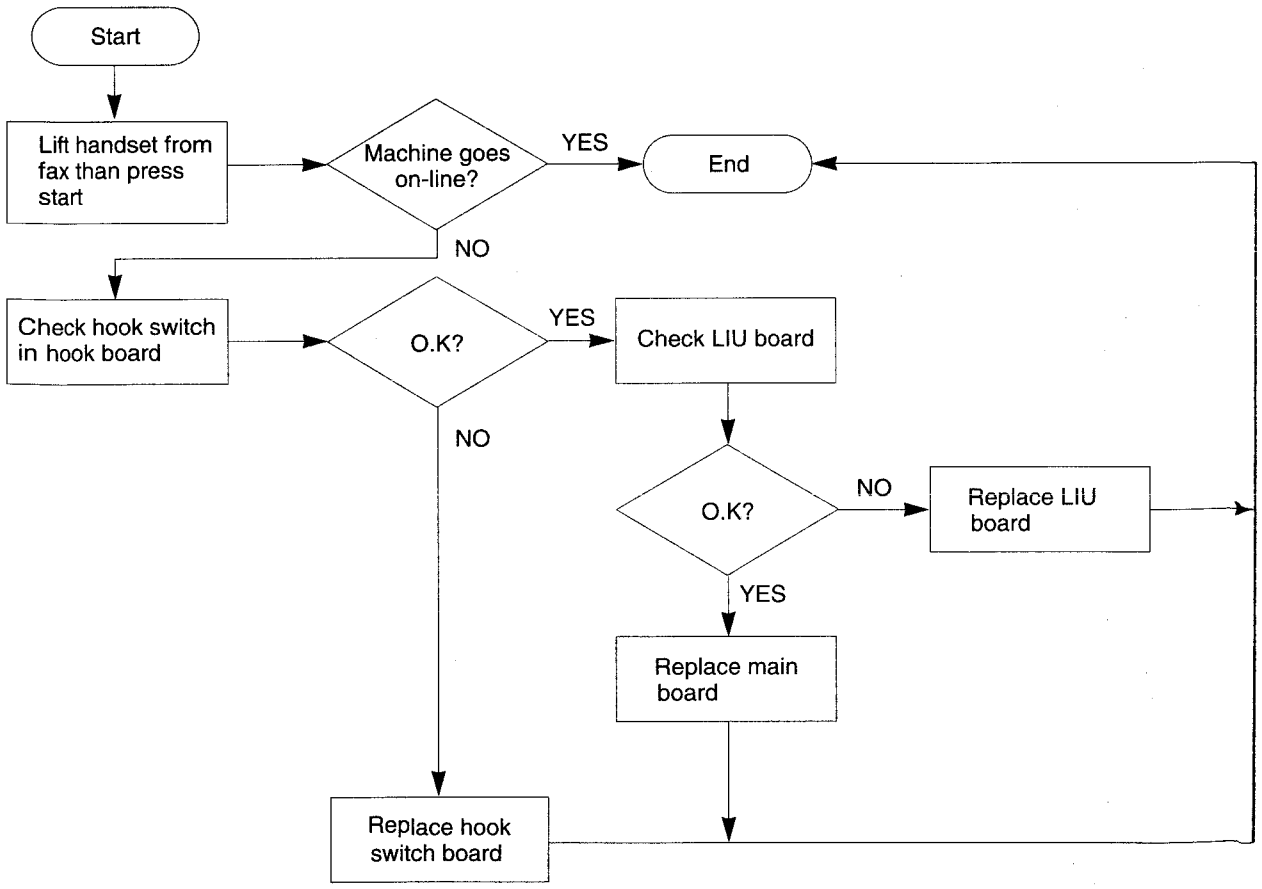


Chart 9 No Receive

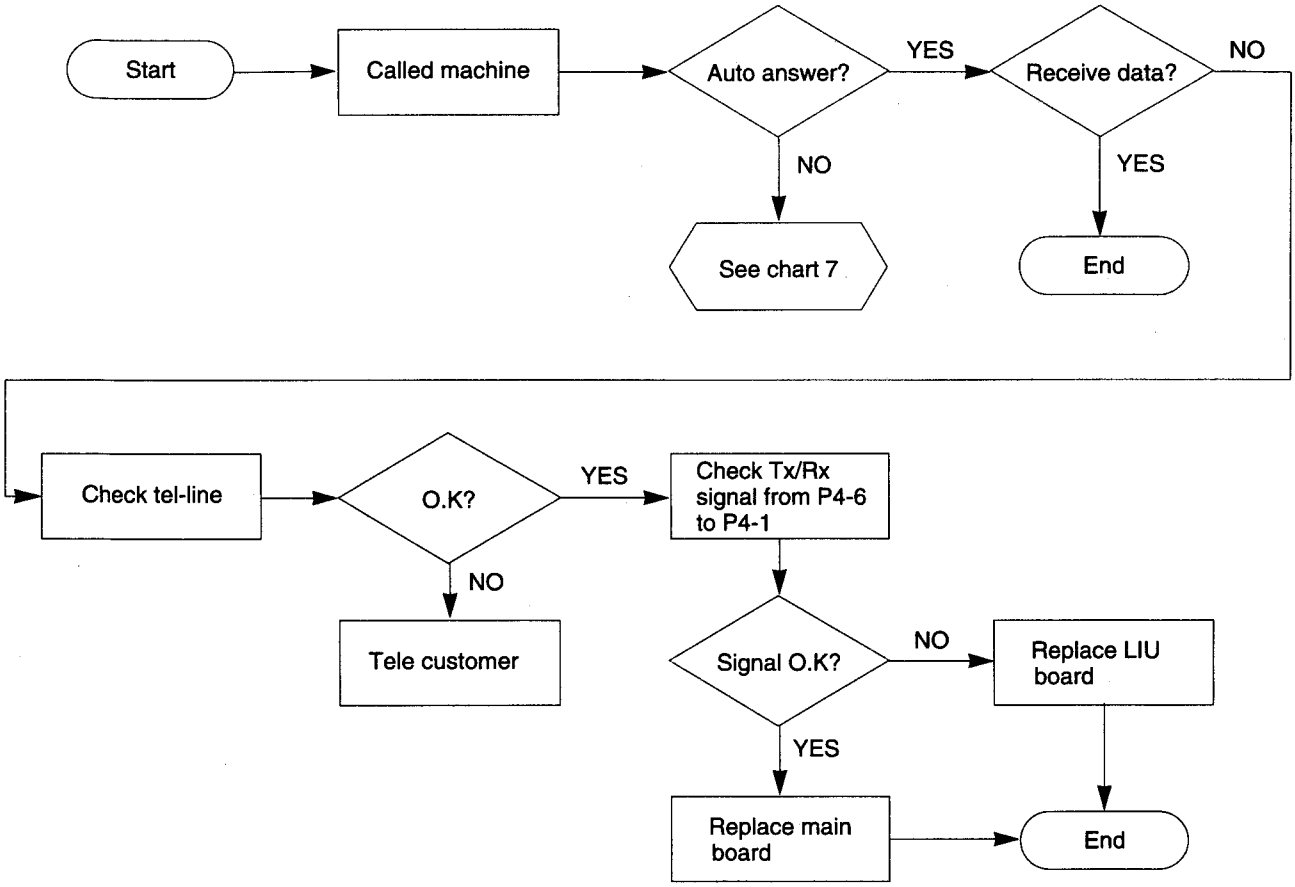


Chart 10 No Dial Tone

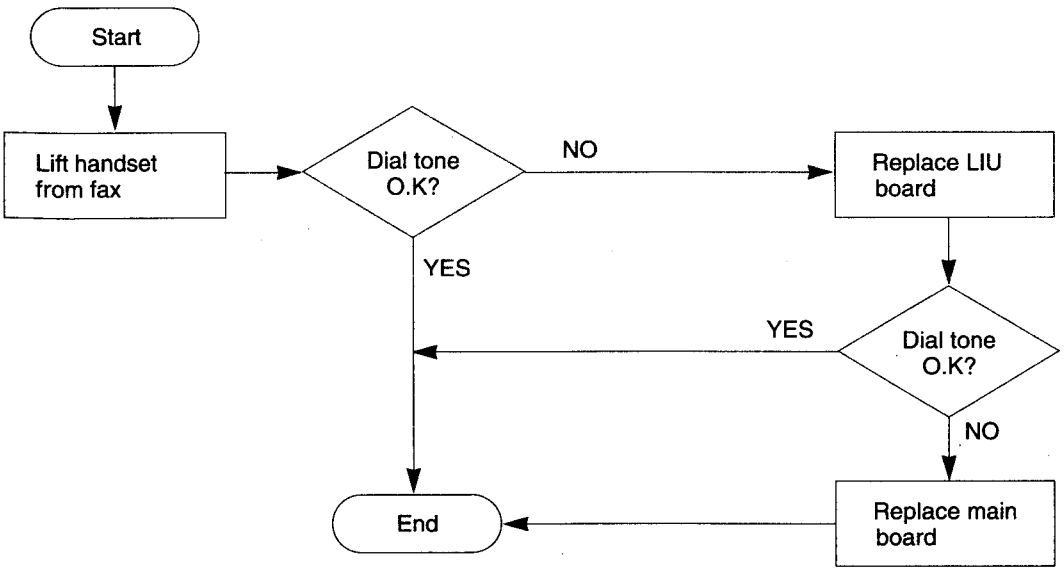
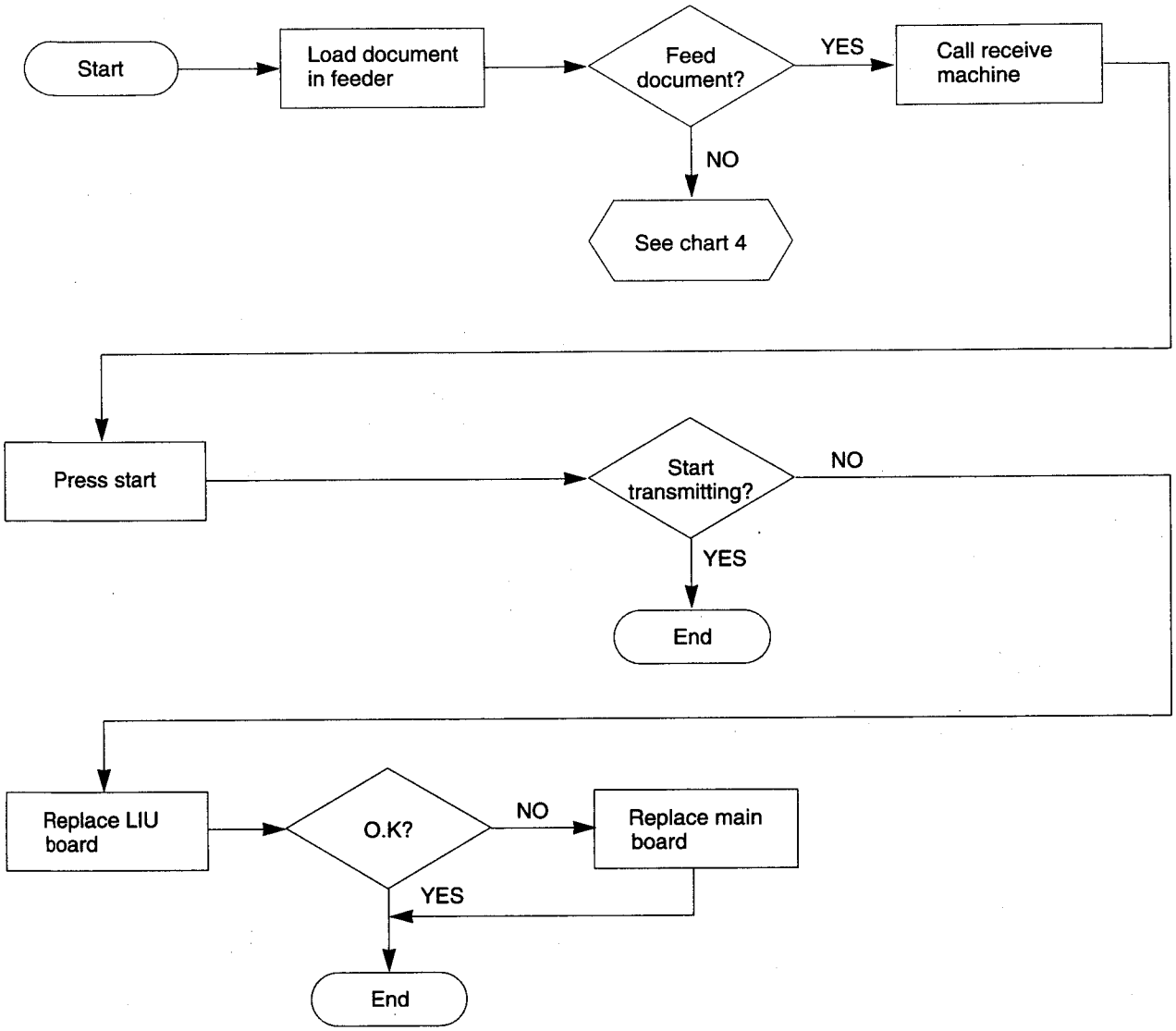


Chart 11 No Transmit



9. Block Diagram

9-1. Block Diagram

9-2. Connection Diagram

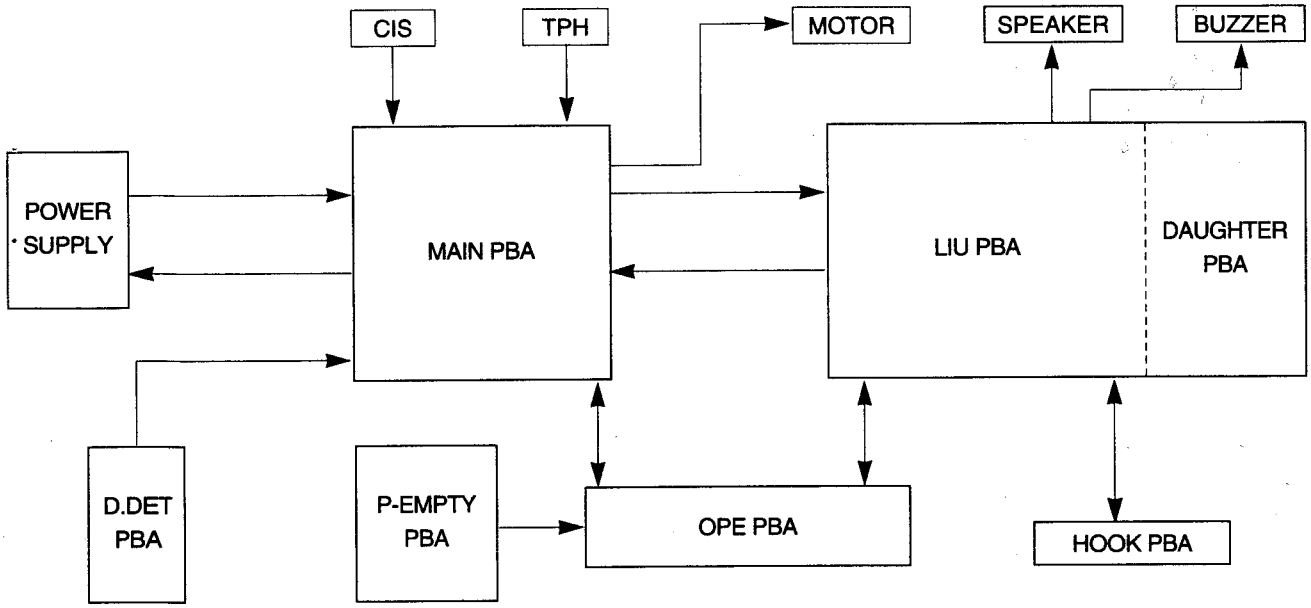
10. Circuit Description & Diagram

10-1. Circuit Description

10-1-1. General Description

1. Main PBA

The main PBA is the board that provides mechanical and board control signal which includes the modem block.



[Fig. 1]

2. LIU / Daughter PBA

This PBA is controls connection of the telephone line to the unit, and also telephone functions including dialing. Daughter board is composed of ringer parts, two slide switch and modular jacks for connection of tel line.

3. Operating Panel PBA

The OPE(operating) PBA is composed of LEDs, keypad, and their control signal. The circuit is divided into key sensing parts to receive user's command and LED display part to report the user of machine's status.

4. Power Supply

The Power Supply supplies +5V, −12V, and +24V to the control board.
The +24V is provided power to motor, TPH, and relay.
The 24CTL is subjected to on/off control of 24V power from the main PBA.

5. D. DET PBA

This small PBA is composed of sensors in order to detect the feeding of document.

6. P. Empty PBA

This is the board which is used to detect the presence of the recording paper using the reflect type photo interruptor.

7. Hook PBA

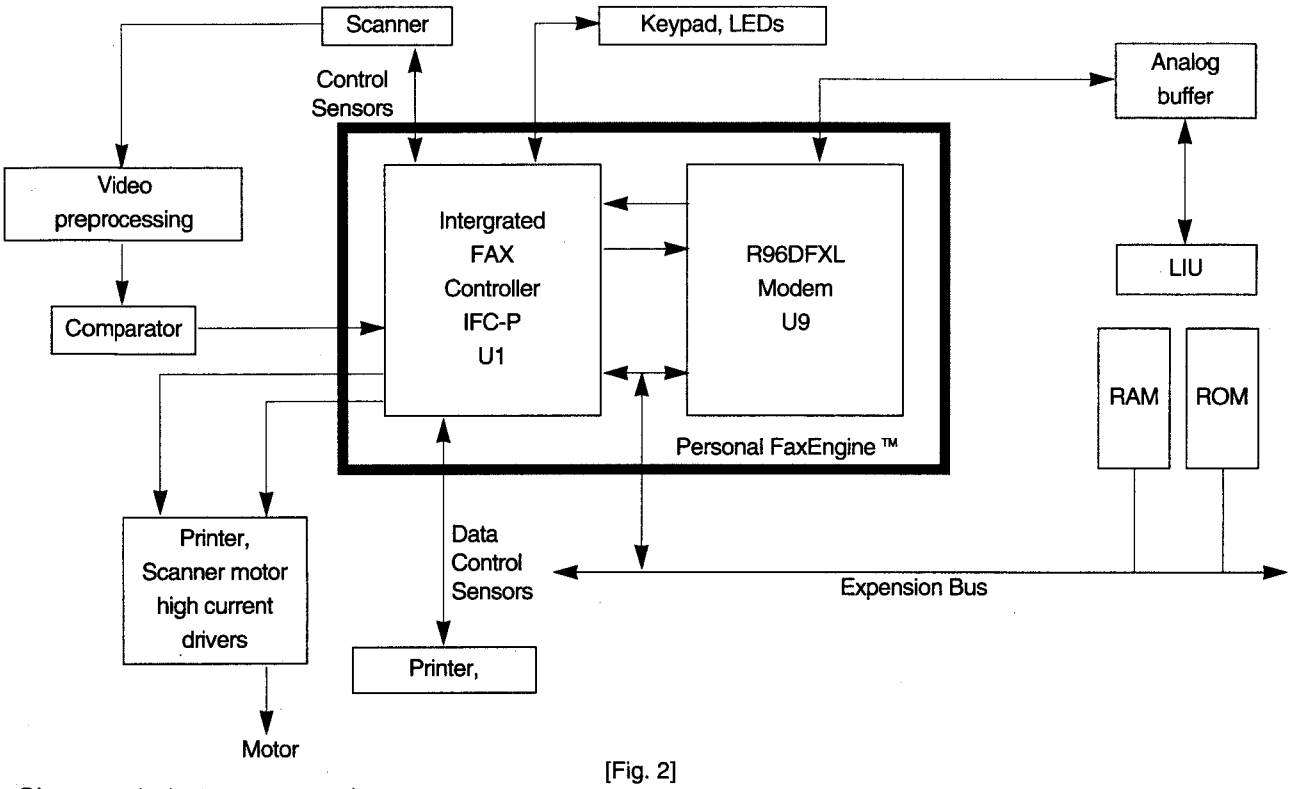
This PBA is composed of hook switch in order to detect handset status.

10-1-2. Description of Electrical System

1. Main PBA

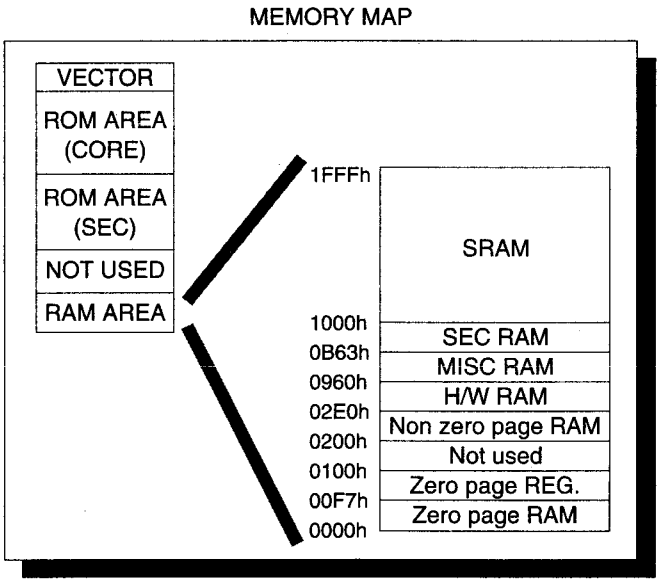
The main PBA consists of 3 major blocks. All facsimile transceiver control blocks are on this board and all of the mechanism control and operating panel control signal are sent and received from this board.

- Fax controller (IFC-P : U1)
- Modem
- I/O control



[Fig. 2]

Given next is the memory mapping.



[Fig. 3]

1) Fax Controller (R96PFE , 100 PIN PQFP :U1)

The fax controller R96PFE contains an internal 8 bit central processing unit (CPU), dedicated circuitry optimized signal processing, and facsimile machine control.

Hardware Description

Micro processor:
Enhanced MC19 central processing unit (CPU).
The CPU provides fast instruction execution and memory efficient input/output bit manipulation.

Motor control:
provided to external current drivers for scanner/printer motor control.

Expansion bus control:
Address, data, control, status, and decoded chip select signals support connection to the external ROM, RAM and optional peripheral device.

Operator interface:
Support the operator key control and LED indicator.

Video control:
The video control function provides for controlling the scanner and for processing its video output.

T4 compressor / decompressor:
provides MH compression/decompression per CCITT recommendation T.4.

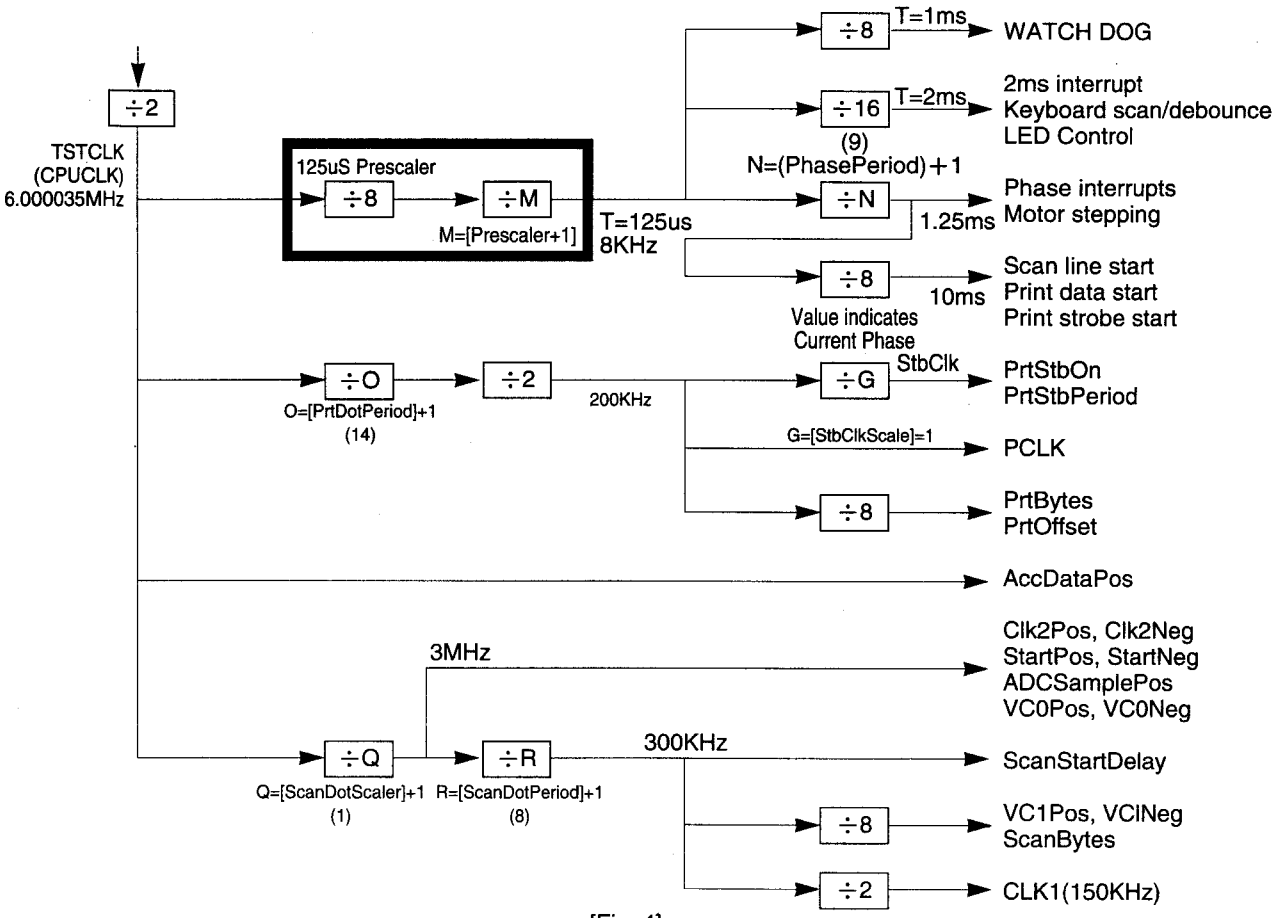
Video processing:
performs shading correction to correct the scanner data for non-linearities in the scanner sensor and light source.

2) IFC-P (Integrated Facsimile Controller Personal) Pin Description

Pin No.	Name	Description
1 - 3	A10 - A8	System bus address 10 - 8
5 - 12	A7 - A0	System bus address 7 - 0
13	/RAMCS	RAM (U7) chip select
14	/ROMCS	ROM (U8) chip select
15	/IOCS	RTC (U14) chip select
18	/SYSCLK	It is driver clock (12MHz) for U1 and supplied from U9(Modem).
20	/MCS	MODEM (U9) chip select
21	/MIRQ	This is interrupt signal from MODEM(U9) to R96PFE(U1).
25	/RESET	When /PORES signal is low the system resets by RESET pin.
26	/PORES	When Vcc(+5V) goes down below 4.5V this signal becomes low.
27	GPIO9 / IRQ	Used to control the LEDs on/off of CIS.
28	GPIO8	Used to detect the ring signal from line.
30	GPIO7	Used to control the CML Relay.
31	GPIO6	Used to control the +24V from POWER.
32	GPIO5	Used to check the hook-off of TAD handset.
33	GPIO4	Used to control the DP relay.
34	GPIO3	Used to control the MUX.
35	GPIO2	Used to check the hook-off of handset.
36	GPIO1	Used to detect the MODE switch.
37	GPIO0	Used to detect whether document loaded or not.
38	TONE	Generated 800Hz key-click sound.
41	PM2/GPO2	Used to control the tone.
42	PM1/GPO1	Used to control the sound.
43	PM0/GPO0	Used to control that the system is remote mode or not.
44 - 47	SM3 - 0	Scan motor phase 3 - 0
48	TADG	THD A/D analog ground
49	THDI	THD A/D input
50	TADV	A/D analog power (+5V)
51 - 52	STRB0 - 1	Printer strobe 0 - 1
54 - 55	STRB2 - 3	Printer strobe 2 - 3
56	STBPOL	PTR strobe polarity. When connected +5V strobe is active low. When connected ground strobe is active high.
57	PLAT	Printer data latch
58	PCLK	Printer data clock
59	PDAT	Printer data
63	ADD2/GPI2	Used to detect whether the system is DP mode or DTMF mode.
64	ADD1/GPI1	Used to detect whether thermal paper is or not.
65	ADD0	Analog video input.
67	VIDCTL1	Region selection signal for peak value extraction of input signal.

Pin No.	Name	Description
69	START	Scan start signal
70	CLK2	Scan clock
71	CLK1/GPIO10	Key board key control signal
73	LEDCTL	LED control signal
74 - 77	OPO0 - 3	Key button / LED strobe 0 - 3
79 - 82	OPI0 - 3	Key board return 0 - 3
83 - 86	D7 - D4	System bus data 7 - 4
88 - 91	D3 - D0	System bus data 3 - 0
94	/RD	Read strobe from CPU
95	/WR	Write strobe from CPU
96 - 100	A15	System bus address 15 - 11
4,29,78		+5V
17,19,39,53,72,87		GND

3) IFC-P Timing Block Diagram



[Fig. 4]

4) Scanner Part

① Scanner Interface

Scanner interface circuit is signal interface with CIS or CCD opto-electrical devices.
This circuit adopts dedicated CIS interface circuit.

CLK 2 : Signal for output to SI lead of image data stored in shift register of CIS by way of CLK 2.
- Dotperiod = (ScanDotScalerperiod) * (ScanDotPeriod+1)
- ScanDotScalerPeriod = (CPUCLK period) * (ScanDotScaler+1)
- ScanDotPeriod and ScanDotScaler is programmable from 0 to 15

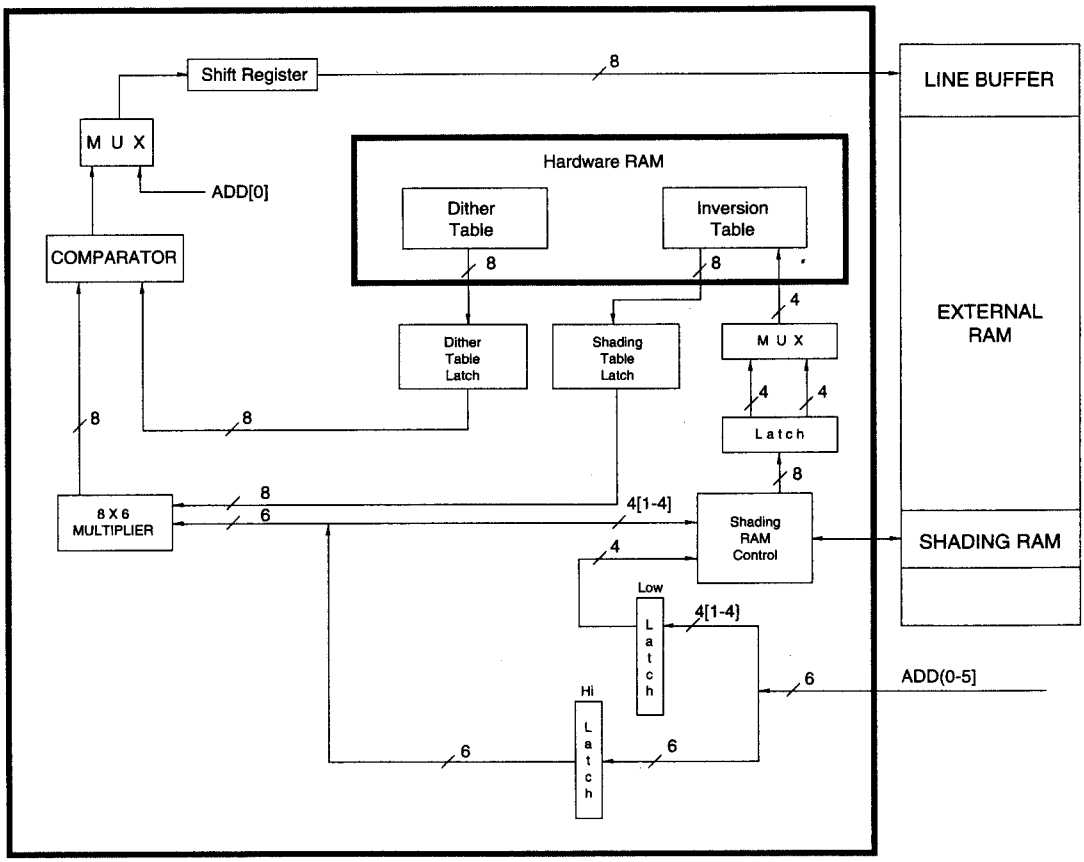
START : Signal to shift the stored charge from led source to shift register. For the following period the signal is stored.
VIDCTL 0 : Digital control lead for external signal processing or test circuitry.
VIDCTL 1 : Acts the same as VIDCTL 0.
Used as lead for determining peak detection to realize ABC(auto back - ground control) in the main board.
ADCLK : Unused, but originally intended for external 6 bit flash A/D converter A/D clock.

Circuit Description

The image data from SI terminal of CIS is supplied to LM393 to be separated into black or white based upon comparator reference voltage, and is input to PFE ADD0.
Comparator reference voltage is determined for ABC control span, selecting 1184 pels among 1728 pels using image data from SI of CIS by means of TC4S66F analog swich.
If the input image level, obtaining from R4, R5 voltage division, is lower than 0.9V, comparator reference input is supplied as 0.9V.

② Video Processing

Black and white image data from LM393 passes ADD0 and MUX to be stored in line buffer.
The stored image data is sent to either printer or modem depending on copy mode.
Video processing block diagram is as follows.



[Fig. 5]

5) Operator Panel Interface

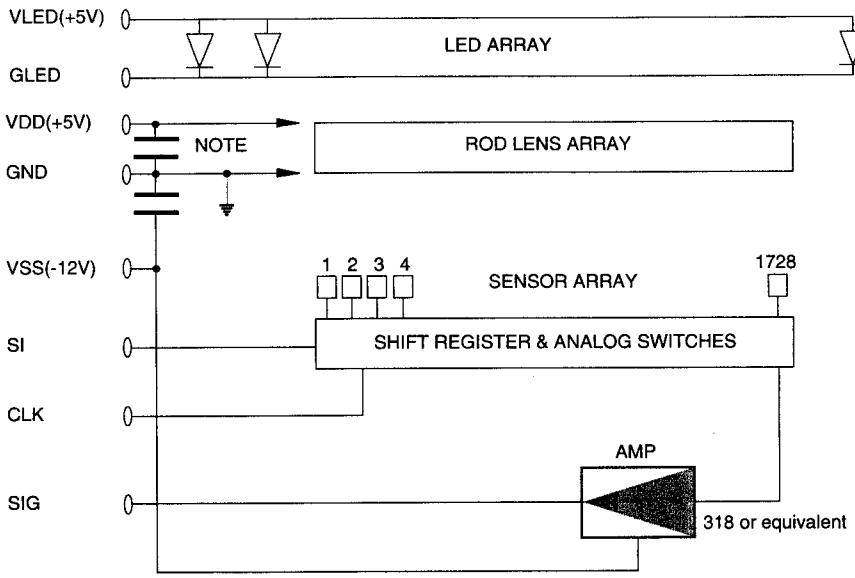
PFE is designed to control 4 by 4 key matrix and 4 LEDs.

OPO 0~3 : Used as keybiard strobe and LED driver.
OPI 0~3 : Used as leads for key scan from key matrix.

2. CIS(Contact Image Sensor)

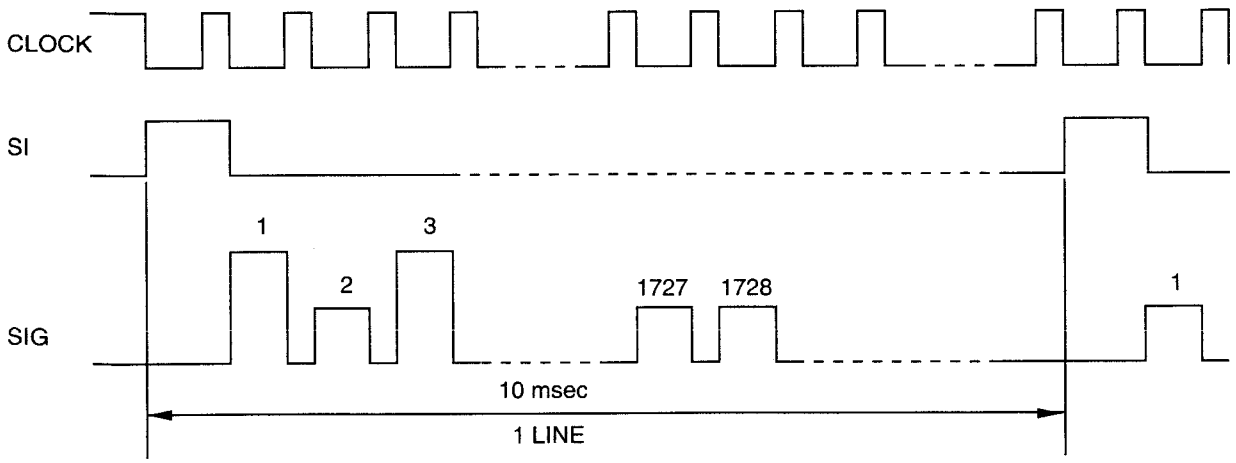
pin 1 : Input signal
pin 2,5 : Analog ground
pin 3 : Analog VDD(+5V)
pin 4 : VSS (−12V)
pin 6 : Start signal
pin 7 : Ground
pin 8 : Clock
pin 9 : GLED (LED control)
pin 10 : VLED (+5V)

Block diagram and timing chart of CIS are Fig. 6 , Fig. 7, respectively



[Fig. 6]

250KHz (L : duty 75%)

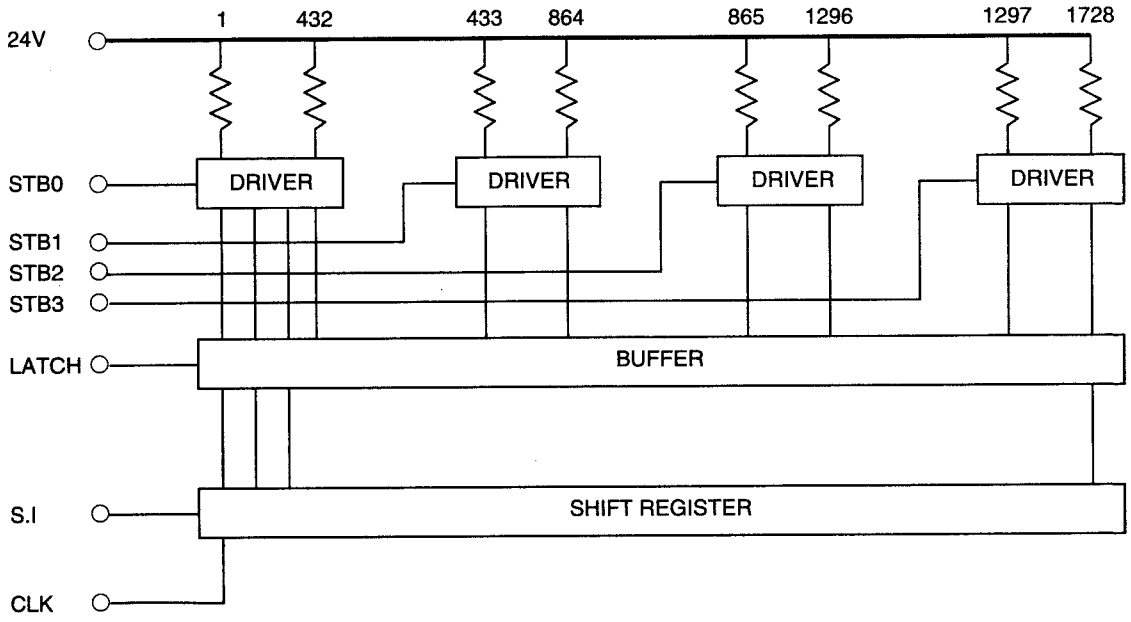


[Fig. 7]

When GLED is high LEDs turn off and when GLED is low LEDs turn on.

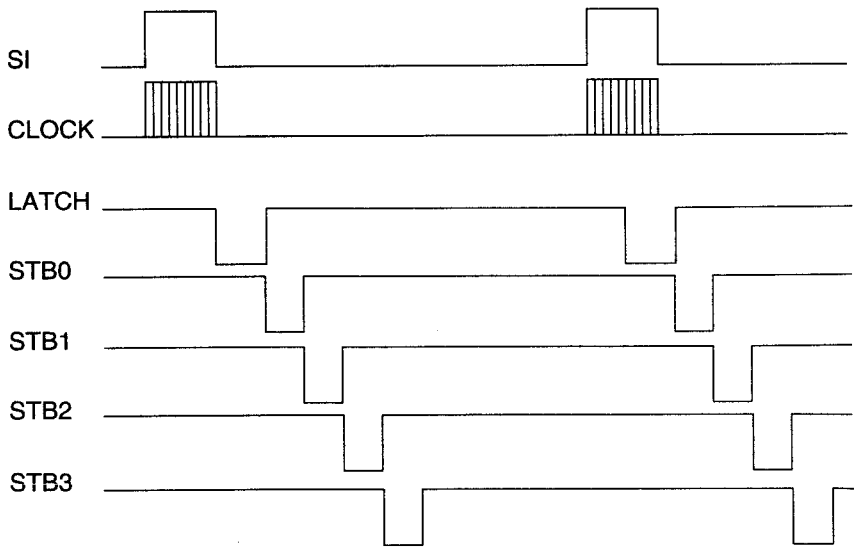
3. TPH (Thermal Print Head)

The TPH consists of shift registers, buffers, drivers, and print resistors.
The resistors that perform the printing are situated with a 1/8mm pitch, 1728 dots in all, 8 dots per mm.
Printing width is 216mm(letter size).
Below is the circuit diagram of the thermal print head, analog with the timing diagram.



[Fig. 8]

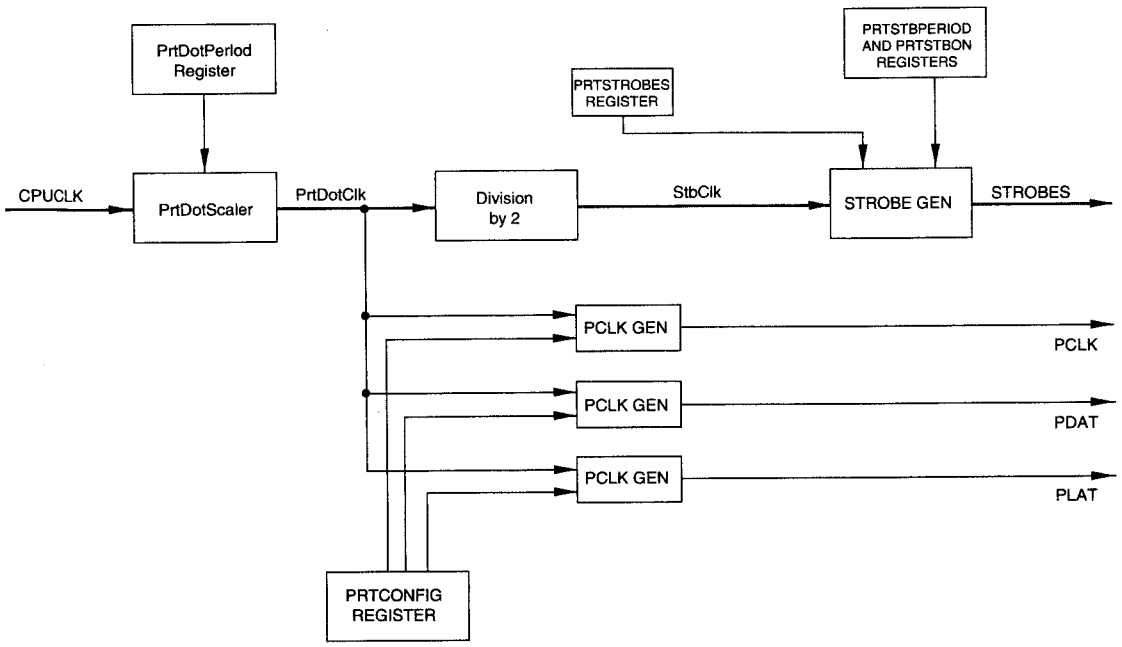
SI : The signal in H-Dark, L-White is presented to the TPH shift register and synchronized in by a clock from the R96FE, after one line of signal a latch pulse comes along to store the information.



[Fig. 9]

1) Printer Control

Fig. 10 is the simplified printer strobe generation block diagram.
All timing in Fig. 9 is driven from the CPUCLK.



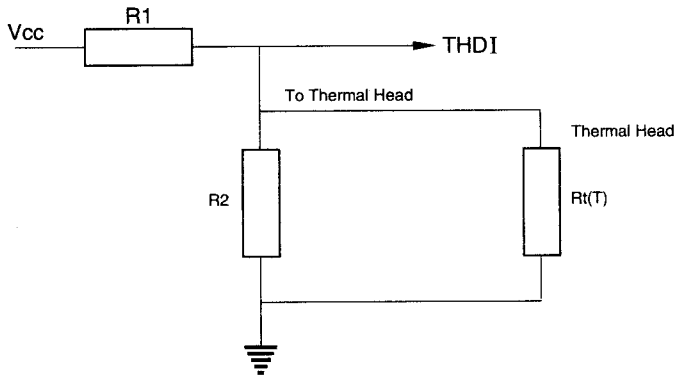
[Fig. 10]

The first scalar in the CPUCLK processing chain is PrtDotscaler, with its scaling controlled by register PrDotPeriod.
The PrtDotScaler output, PrtDotClk, is used to form all printer control signals, and PrtDotClk divided by two is the StbClk signal used to form all printer strobes.
The strobe generator is under control of three registers: PrtStbPeriod, PrtStbOn, and PrtStrobes.

The manner which way the THDI input is connected to the thermal head is shown in the circuit in Fig. 11

2) Printer Thermal Sensor

The IFC-P includes a printer thermal sensor interface to monitor the head temperature of the thermal printer, and firmware controls strobe widths.



R1 and R2 can be caculated from the following formulas :

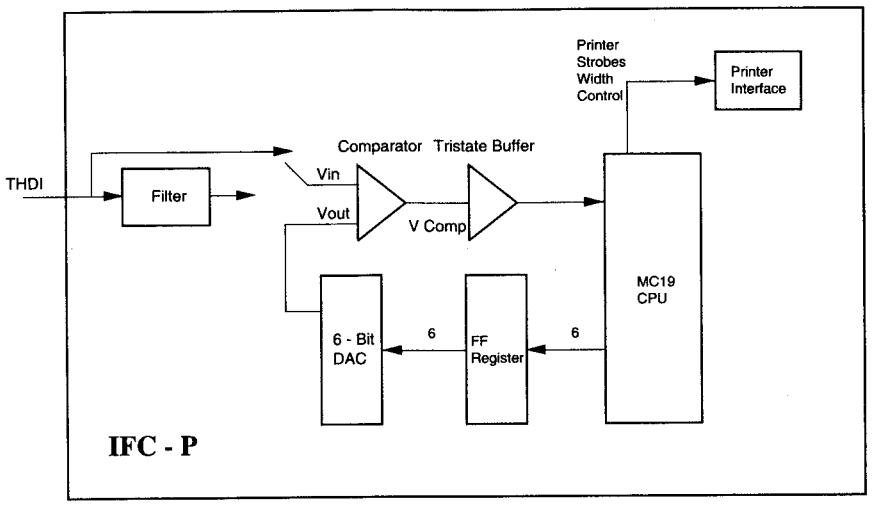
$$R2 = [15Rt(T1) * Rt(T2)] / [Rt(T1)-16Rt(T2)]$$

$$R1 = 0.25 * [R2 * Rt(T1)] / [R2 + Rt(T1)]$$

Where :
T1 - min temperature
T2 - max temperature

[Fig. 11]

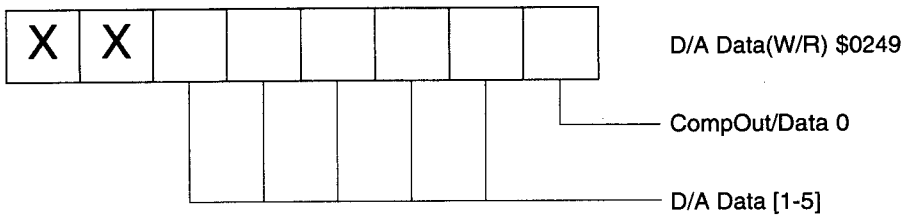
The simplified block diagram of this interface is shown in Fig. 12
The schematic includes a 6-bit DAC and comparator. Incoming signal Vin ranges from 1 to 4V. This signal can be low-pass filtered, or the filter can be by passed by setting bit 4 in the PrtConfig Register in Fig. 13



[Fig. 12]

3) Register D/A Data

Data can be loaded into the DAC using register D/A Data illustrated in Fig. 13.
Bit 0 of this register is used as the Data 0 input in write mode. When in read mode, this input is used to access a comparator output.

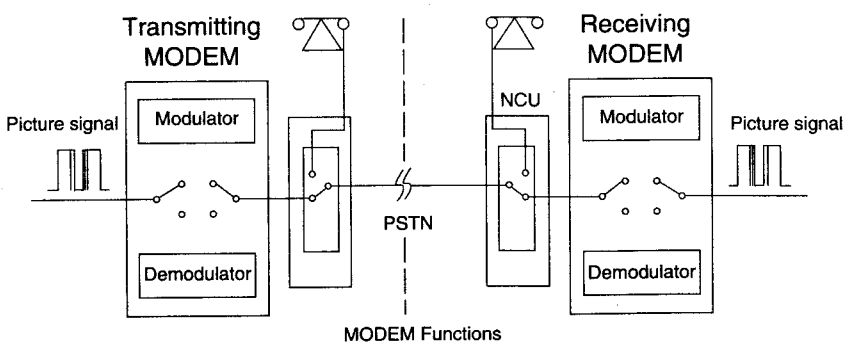


[Fig. 13]

4. Modem Block

The R96DFXL modem is a synchronous 9600 bits per second(bps) half-duplex modem with error detection and DTMF reception. It has low power consumption and requires only a single +5VDC power supply.
The modem can operate over the public switched telephone network(PSTN) through line terminations provided by a data access arrangement(DAA).
The R96DFXL is designed for use in group 3 facsimile machines.
The modem satisfies the requirements specified in CCITT recommendations V.29, V.27ter,V.21 Channel 2(FSK), and T.4, and meets the binary signaling requirements of T.30.
The modem can also perform HDLC framing according to T.30 at 9600,7200,4800,2400 or 300bps.
The modem includes a programmable DTMF receiver and three programmable tone detectors which operateconcurrently with the V.21 channel 2 (FSK) receiver.

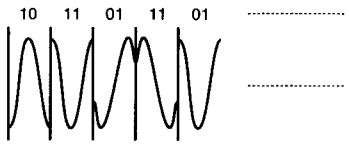
1) Modem Function
The MODEM consists of modulator and a demodulator; the modulator is used for signal transmission and the demodulator is used for signal reception.



[Fig. 14]

2) Types of picture signal modulation.

The CCITT recommendations specify the methods of picture signal modulation for the different facsimile classifications as listed below.

CCITT & Recom-mendations	Modulation Method	Actual waveform
G3 (V27 ter)	Phase modulation 2400 bps 4800 bps	4 bits for white, 4 bits for black and 4 bits for black are encoded as 10110111011. • Example of phase modulation (2400 bps) 
(V29)	AC/DC amplitude modulation 7200 bps 9600 bps	• AC/DC amplitude modulation is a type of phase modulation.

[Fig. 15]

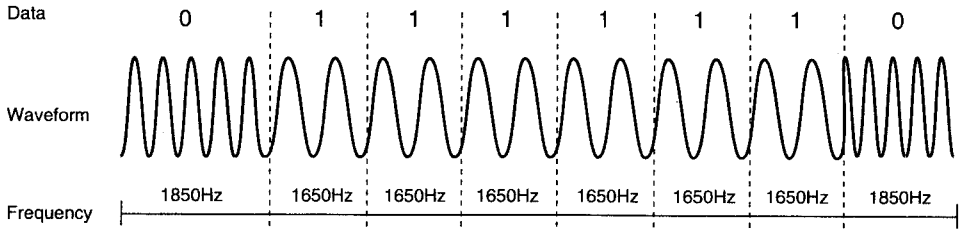
3) Types of control protocol signal modulation.

Tonal signal and binary signals are used to control protocol signals. Tonal signals are used for analog facsimiles, and binary signals are used for digital facsimiles.

- Tonal signal
  Tonal signals are single-tone signals having different frequencies.
  Note the three different total signal frequencies as follows.
  1100 Hz
  2100 Hz

- Binary procedure signals.
  Binary procedure signals use numeric value 1 and 0, which are separately converted into two different frequencies (1,650 Hz for 1 and 1,850 Hz for 0).
  A total of 300 numeric values are transmitted per second.
  Binary data is expressed using numeric value 1 and 0, and bits are the units of binary data.

  Consequently, the 300 numeric values are 300 bits of data.
  The bps (bit per second) is used to indicate the data transmission rate per second.
  In this way, the binary procedure signal is transmitted at 300 bps.



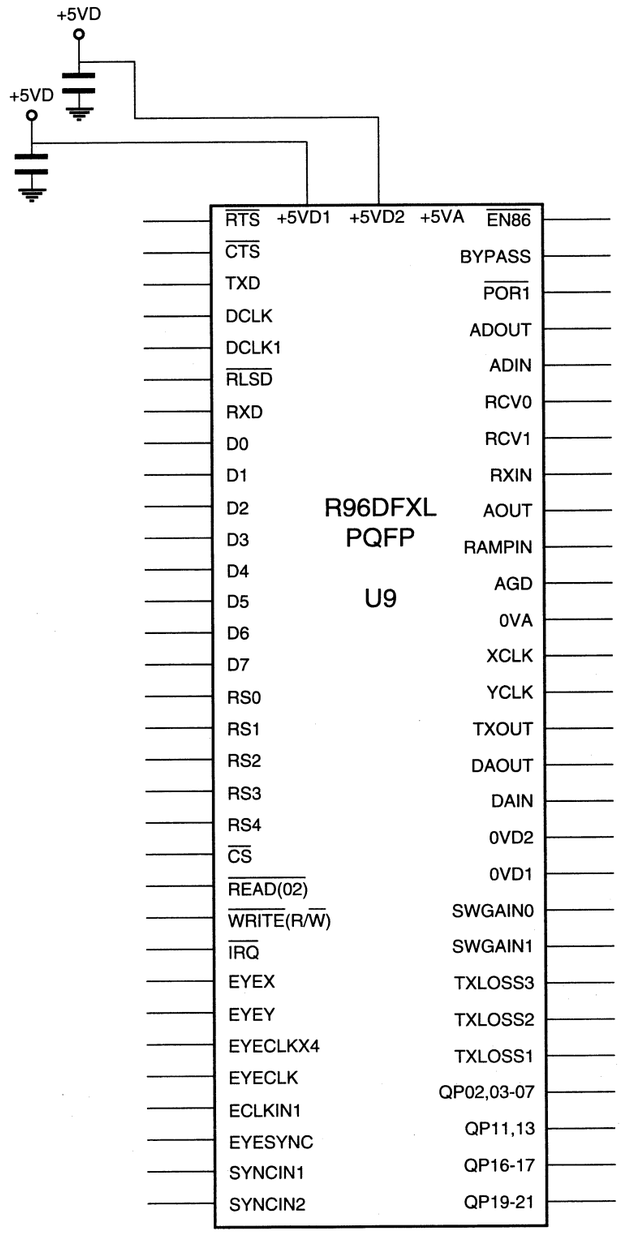
[Fig. 16]

4) Transmitted Data Spectrum

The transmitted data spectrum is shaped in the baseband by an excess bandwidth finite impulse response (**FIR**) filter with the following characteristics.

When operating at 2400 baud, the transmitted spectrum is shaped by a square root of 20% raised cosine filter.
When operating at 1600 baud, the transmitted spectrum is shaped by a square root of 50% raised cosine filter.
When operating at 1200 baud, the transmitted spectrum is shaped by a square root of 90% raised cosine filter.

The out-of-band transmitter energy levels in the 4 kHz~50 kHz frequency range are below −55.0 dBm.



[Fig. 17]

5) Pin Description

Pin No.	Signal Name	Description	Pin No.	Signal Name	Description
1	GPO3	General Purpose Input Output	51	NC	
2	GPO4	General Purpose Input Output	52	/IRQ	Interrupt Request
3	GPO5	General Purpose Input Output	53	/WRITE	WRITE Enable
4	GPO6	General Purpose Input Output	54	/CS	Chip Select
5	GPO7	General Purpose Input Output	55	/READ	Read Enable
6	OVD2	Connect to Digital Ground	56	RS4	Register Select 4
7	OVD2	Connect to Digital Ground	57	RS3	Register Select 3
8	D7	Data Bus Line7	58	RS2	RS2Register Select 3
9	D6	Data Bus Line6	59	RS1	Register Select 1
10	D5	Data Bus Line 5	60	RS0	Register Select 0
11	D4	Data Bus Line 4	61	GP13	General Purpose Input
12	D3	Data Bus Line 3	62	NC	
13	D2	Data Bus Line 2	63	GP11	General Purpose Input
14	D1	Data Bus Line 1	64	/RTS	Request to Send
15	D0	Data Bus Line 0	65	/EN85	Enable 8085 Bus
16	OVD2	Connect to Digital Ground	66	OVD2	Connect to Digital Groud
17	OVA	Connect to Analog 0V Ground	67	/PORI	Power-ON-Reset Input
18	RAMPIN	Receiver Amplifier Input	68	XTLI	Connect to Crystal
19	NC		69	XTLO	Connect to Crystal
20	NC		70	XCLK	12MHz Output
21	OVA	Connect to Analog 0V Ground	71	YCLK	6MHz Output
22	+5VD2	Connect to Digital +5V Power	72	+5VD2	Connect to +5V Digital Power
23	OVD1	Connect to Digital Ground	73	DCLKI	Connect to DCLK
24	SWGAIN1	Connect to SWGAINO	74	SYNCIN2	Connect to
25	ECLKIN1	Connect to EYECLK	75	GP16	General purpose Input
26	SYNCIN1	Connect to EYESYNC	76	GP17	General purpose Input
27	NC		77	OVD2	Connect to EYESYNC
28	NC		78	/CTS	Clear to Send
29	NC		79	TXD	Transmit Data
30	OVA	Connect to Analog 0V Ground	80	OVD2	Connect to Digital Ground
31	NC		81	OVD2	Connect to Digital Ground
32	NC		82	DCLK.	Transmit & Receive Data CLK
33	NC		83	EYESYNC	Serial Eye Pattern Strobe
34	DAIN	Connect to DAOUT	84	EYECLKX	Serial Eye Pattern Clock
35	ADOUT	ADC OUT	85	EYECLK	Serial Eye Pattern Clock
36	BYPASS	Receive High-pass Filter	86	EYEX	Serial Eye Pattern X Output
37	RCVI	Connect to RCVO	87	ADIN	Connect to ADOUT
38	TXLOSS3	2dB of Analog Tx Level Att	88	DAOU	DAC/AGC Output
39	TXLOSS2	4dB of Analog Tx Level Att.	89	OVD2	Connect to Digital Ground
40	TXLOSS1	8dB of Analog Tx Level Att.	90	EYEY	Serial Eye Pattern Y Output
41	NC		91	GP21	General purpose Input
42	NC		92	OVD2	Connect to Digital Ground
43	OVA	Connect to Analog 0V Ground	93	GP20	General purpose Input
44	TXOUT	Connect to TXA Filter Input	94	GP19	General purpose Input
45	RXIN	Connect to RXA Filter Output	95	RXD	Receive Data
46	+5VA	Connect to Analog +5V Power	96	/RLSD	Receive Line Signal Detected
47	OVA	Connect to Analog 0V Gronud	97	OVD2	Connect to Digital Ground
48	AGD	+2.5V Analog Ground	98	RCVO	Mode Select Output
49	AOUT	Smoothing Filter Output	99	SWGAINO	Connect to SWGAIN1
50	OVD1	Connect to Digital Ground	100	GP02	General purpose Input Output

5. LIU PBA. UNIT

The LIU PBA Unit composed of the following 4 sections:

- Telephone (No Power Operation)
- Ringer and Ring detect
- Signal/Data Interface
- Hook detect
- Telephone Section

In the off - hook state , the phone line is connected to rectifier.
Diode BD1 through SW-3 and speech network IC U2.

The handset contains a microphone and a conventional dynamic speaker.

Receiving signal is received through R16, R17, R18 and transmitting signal from handset mic. is amplified speech IC U2 pin 8 and through C36, R33 and amplified in the U2 inside Pin 1 and then transmitted to the tel. line through speech drive TR Q1.
Dialing parts (U1, Q2, Q3, Q4) is operated in NO POWER state. In the TONE dial mode , U1 produce tone dial signal.

This signal is passed through LPF (Q4, R35,R36,R37,C33, C44) C34, R36 and is input U2 Pin 10 and transmitted same as transmission path.

In the pulse mode , this sequence is passed to the line by dial switch Q3, Q1.

This section is composed of a ringer IC U3,U4 , and their peripheral components.
The ringer signal is supplied through C29 R39 to U3, where the signal is turned in to an FSK sound to drive the electrical buzzer and also detect calling signal by R42, U4 in the calling signal. Sound volume selection among high, low.
OFF is made aw 1.

Signal / Data Interface Section

This section composed of relay K1, matching transformer T1, and performs dc loop line is get the facsimile side also performs impedance matching in transmission/ reception of Tx/Rx signal in the facsimile machine and separation of the line and secondary circuit.

Hook detection section

This is composed of a photo coupler U7 and their peripheral components. The section operates on DC loop interruption in the exit phone line.

10-1-3. Fundamental Operational Description

1. Transmit Operation

In standby mode. Integrated facsimile controller checks out document detect sensor to see its status. If it goes on.
Stepping motor starts counter revolving to move CAM to Tx position. Afterwards, stepping motor revolves so that document get loaded to CIS scanning point.
When START/COPY key is pressed in off-hook state, CML relay is connected to modem.
After the connection with the other party is completed, stepping motor moves document to the scanning point of CIS.
The opto-electrical converted image data in CIS is separated into Black and White by means of comparator, and stored in shift register, consequently residing in External RAM after serial-to-parallel conversion.
These parallel data is compressed based on MH coding, and sent to modem.
Subsequently, the modem converts the digital data to analog form and transmits them to line through line interface unit.

2. Recieve Operation

Receive mode is categorized into manual reception, auto reception, and TEL/FAX switching.
In manual reception, CML relay is connected to modem after START/COPY key operation in off-hook state.
In automatic reception, IFC checks ring detect port to see if it changed from hi to low. If it does, CML relay is connected automatically after pre-determinal ring count.
In TEL/FAX switching mode. TAD connected to external phone is involved.
In this mode, ring count is set to 6 times, and CML relay gets connected to modem after this 7 high to low transitions of ring detect port.
The above reception modes are selected by RCV mode button.
IFC checks ring detect port, and makes stepping motor counter-revolve to position CAM to Rx mode.
Then, the data received from the other party is demodulated into digital form to be stored in external RAM.
The data stored in COMM. Buffer is decompressed on MH decoding scheme, and sent to TPH to print out the image.

3. Copy Mode

IFC checks document detect sensor in standby mode.
If the sensor turns on, stepping motor counter-turns to set CAM position to copy mode by the way Tx mode.
After copy mode is set, stepping motor turns in ordinary way and loads document to scanning point.
If START/COPY key is pressed in on-hook state. stepping motor turns to take down document.
The opto-electrical converted image data is divided into black and white.
Employing comparator, to be stored in shift buffer inside IFC-P.
This serial data is changed to parallel data to arrive at external RAM.
Then, the image data in external RAM is fed to TPH to print out the image.

10-2. Circuit Diagram

10-2-1. Main

10-2-2. LIU

10-2-3. OPE

10-2-4. Daughter

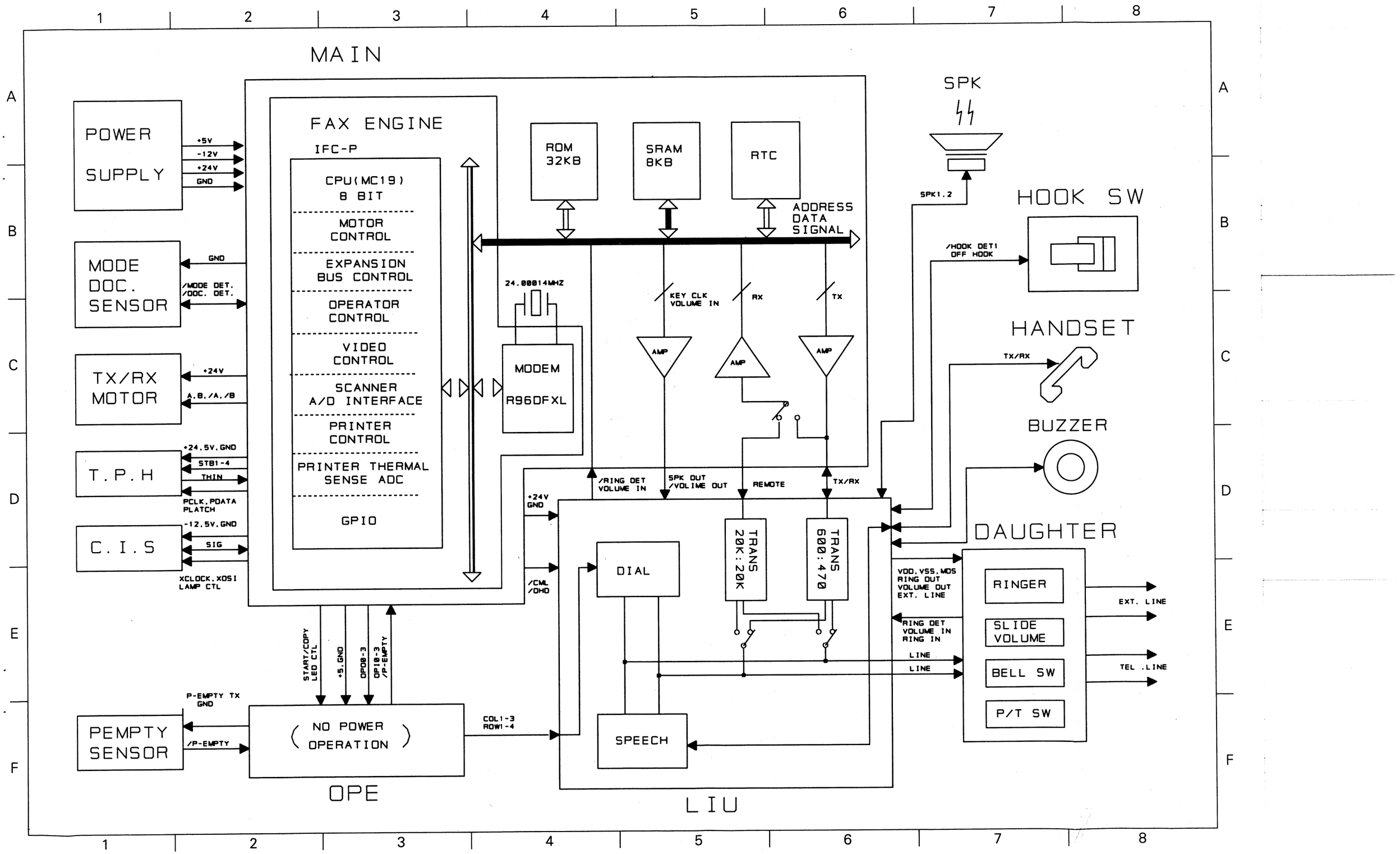
10-2-5. Hook

10-2-6. D-DET

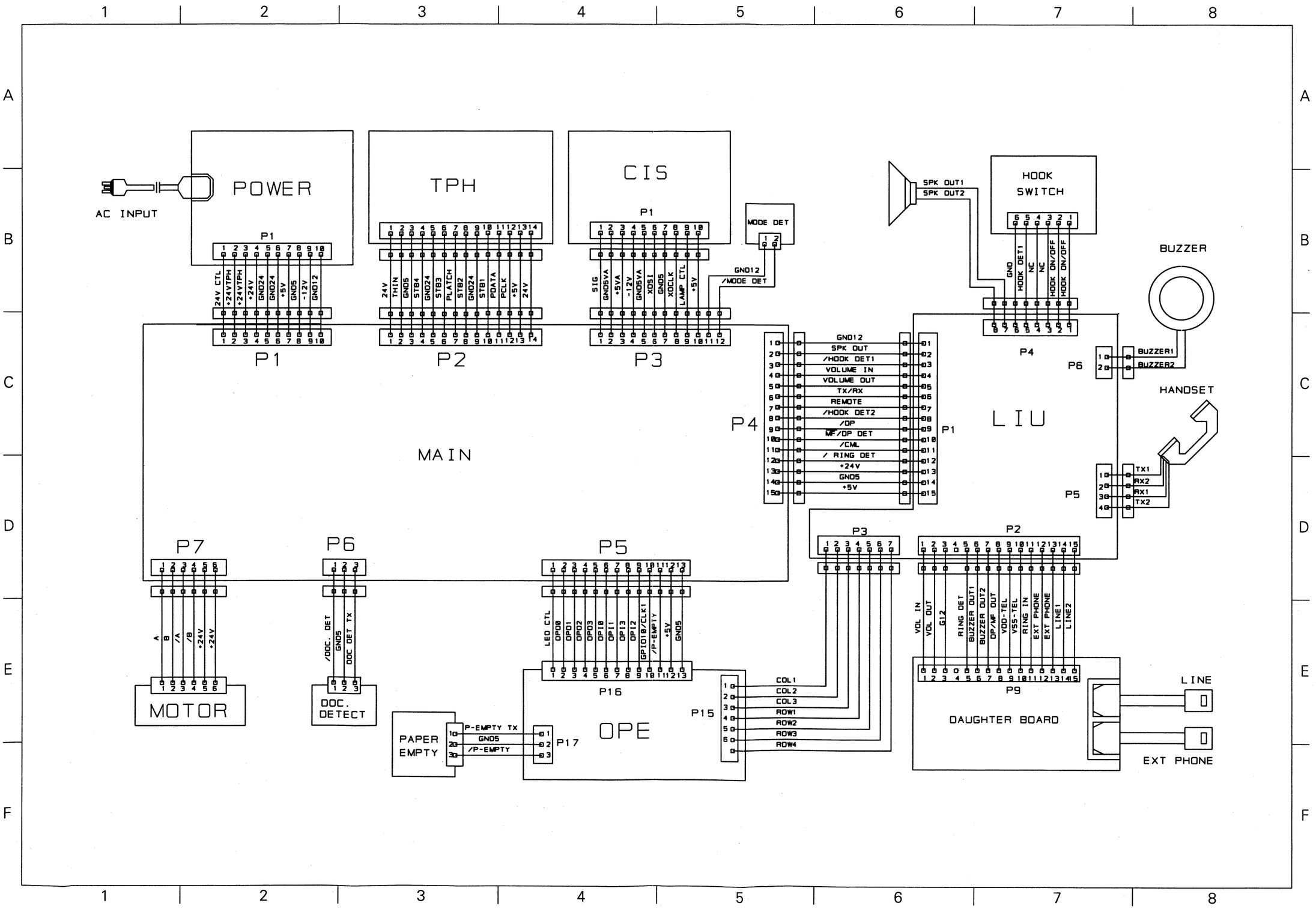
10-2-7. P-Empty

10-2-8. Power Supply

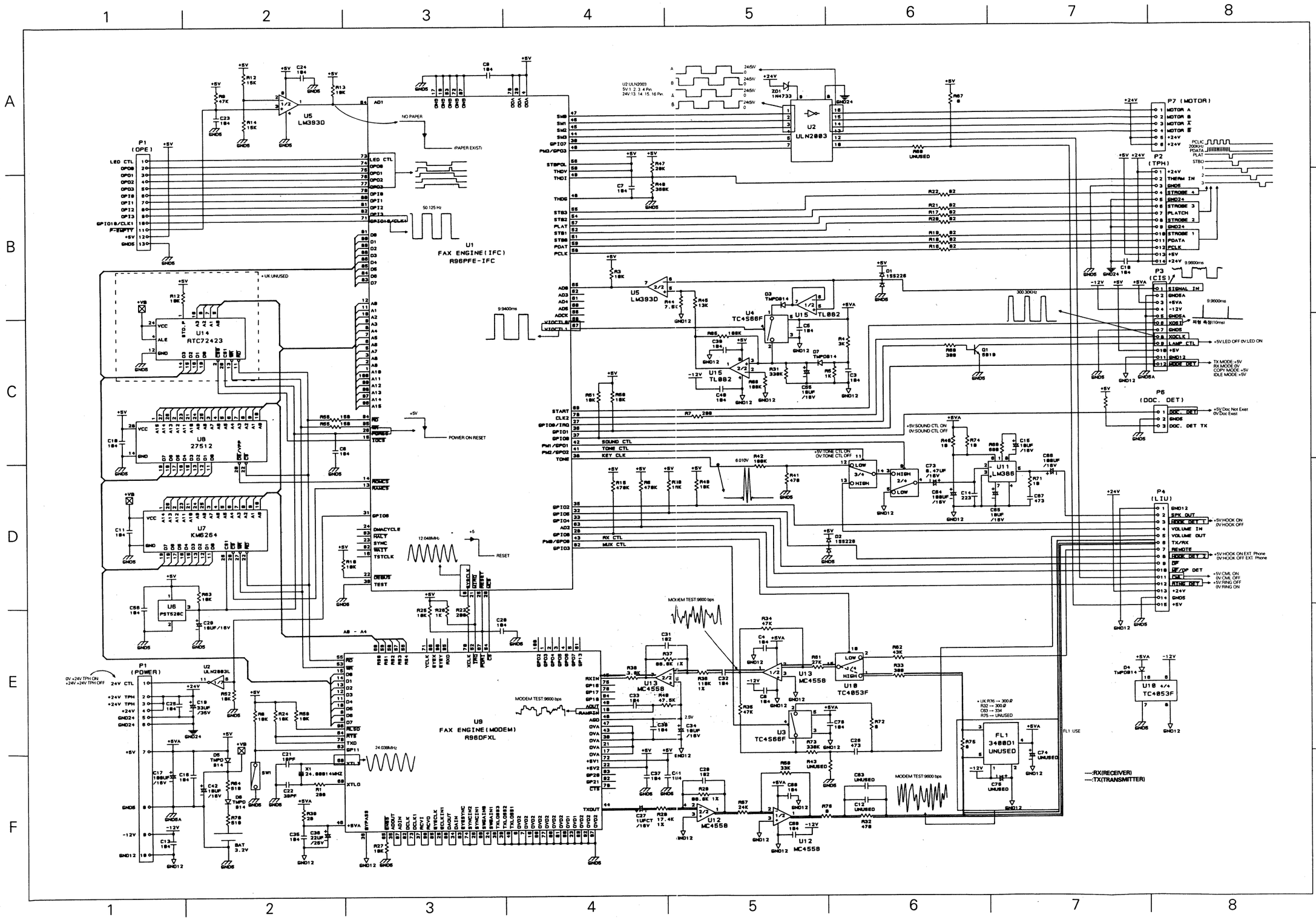
9-1. Block Diagram



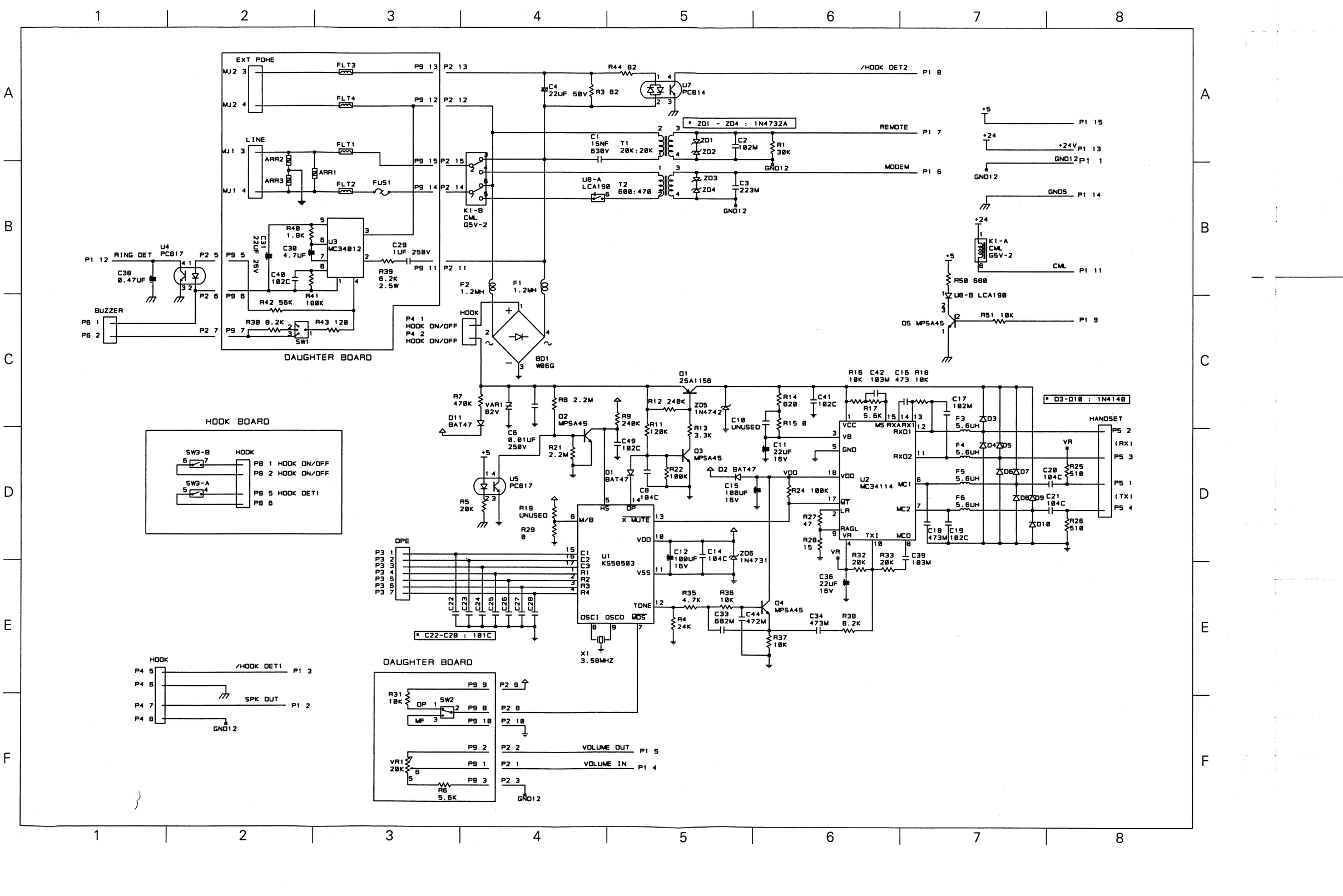
9-2. Connection Diagram

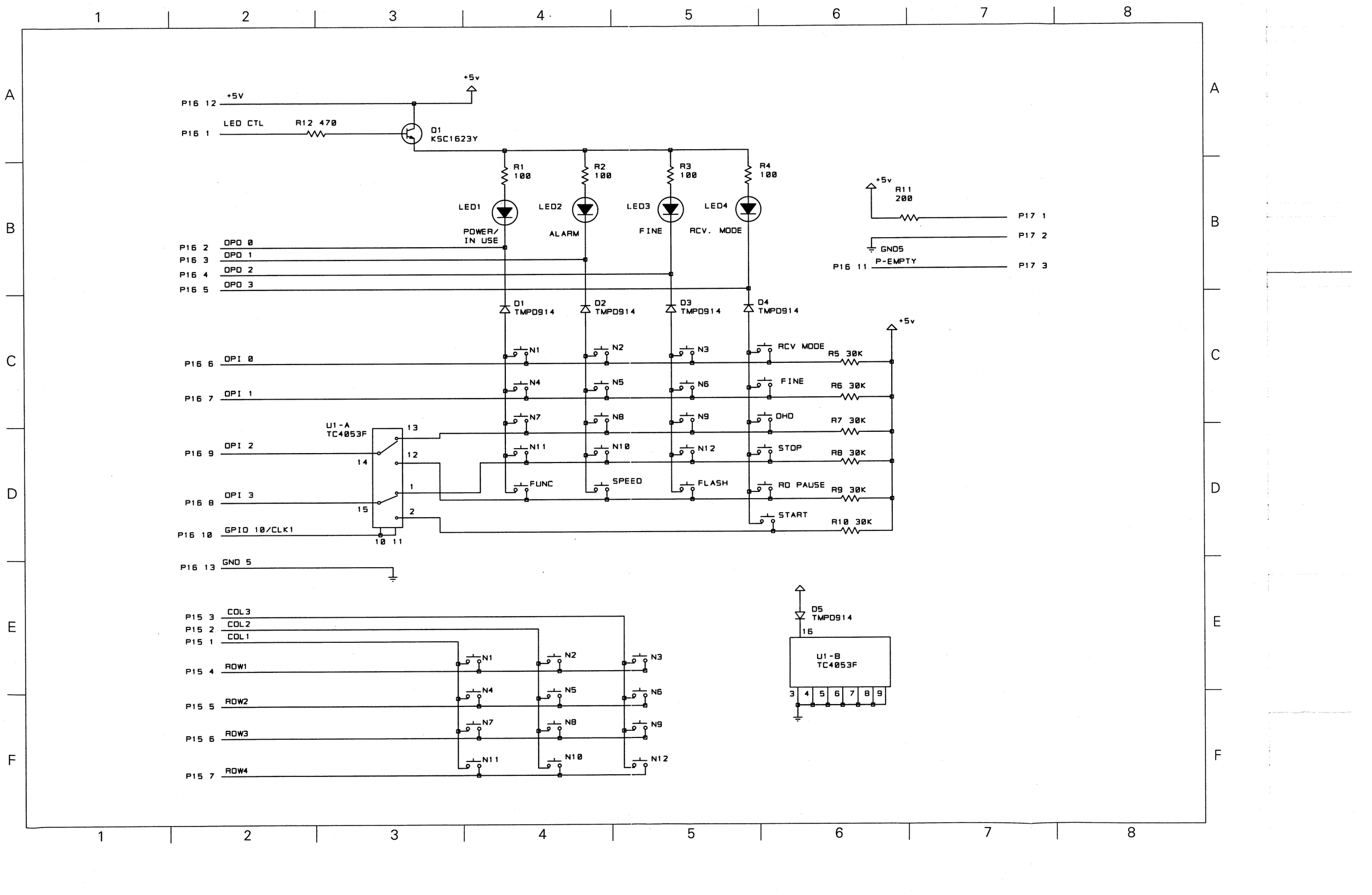


10-2-1. Main

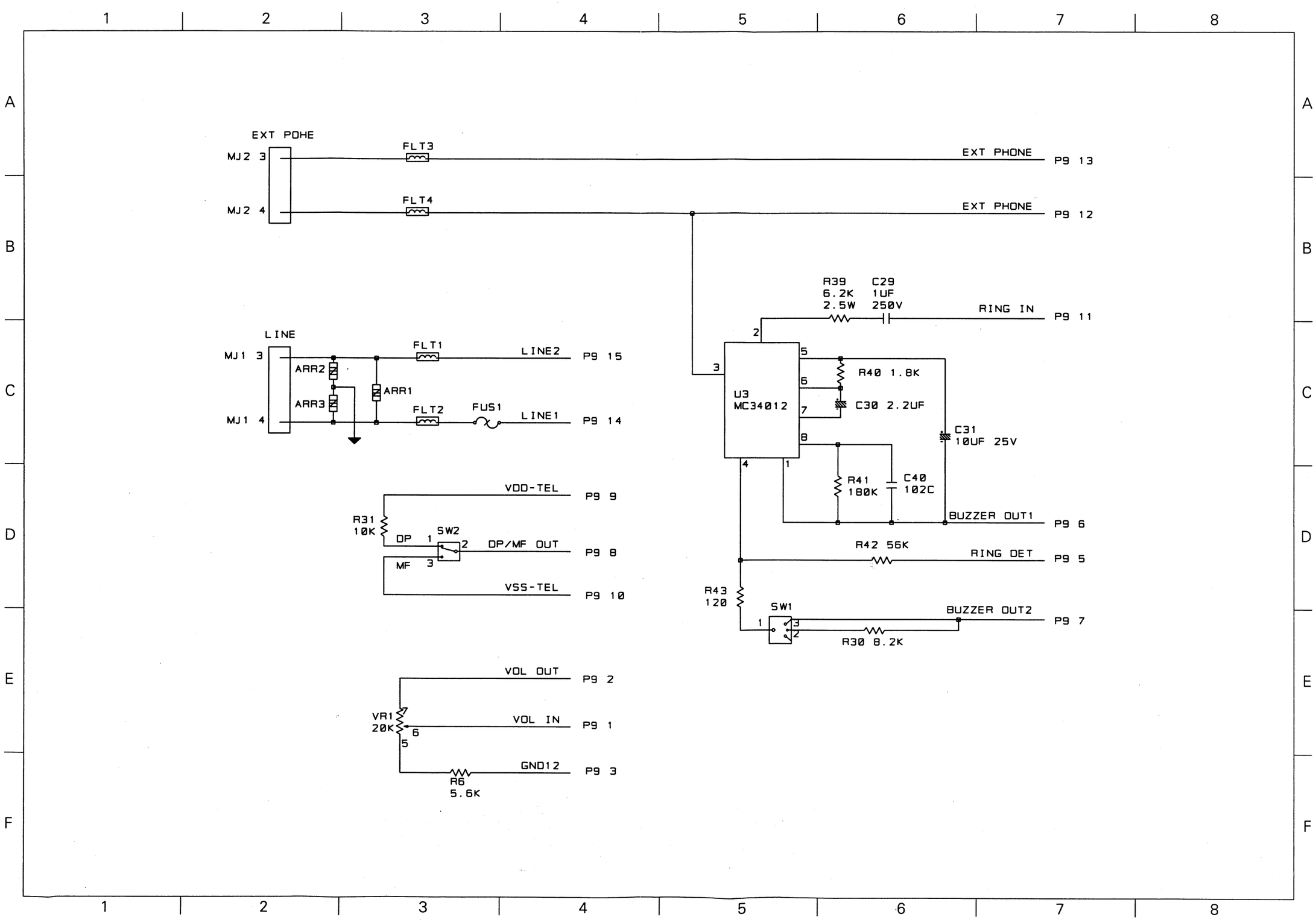

U5 LM393D
U2 ULN2803
U1 FAX ENGINE(IFC) R98PFE-IFC
U14 RTC72423
U8 27512
U7 KM6264
U6 PST528C
U9 FAX ENGINE(MODEM) R96DFXL
U4 TC4S66F
U15 TL882
U13 MC4558
U12 MC4558
U18 TC4053F
U3 TC4S66F
U11 LM386
U2 LILN2803L
P1 (OPE)
P7 (MOTOR)
P2 (TPH)
P3 (CIS)
P6 (DOC. DET)
P4 (LIU)
P1 (POWER)
FL1 3488D1 UNUSED
NO PAPER
(PAPER EXIST)
POWER ON RESET
RESET
SOUND CTL
TONE CTL
KEY CLK
RX CTL
MUX CTL
MODEM TEST:9600 bps
9.9400ms
300.30KHz
9.9600ms
24.036MHz
12.048MHz
50.125 Hz
6.010V
+5V SOUND CTL ON 0V:SOUND CTL OFF
+5V:TONE CTL ON 0V:TONE CTL OFF
+5V:LED OFF 0V:LED ON
TX MODE:+5V RX MODE:0V COPY MODE:+5V IDLE MODE:+5V
+5V:Doc Not Exist 0V:Doc Exist
+5V:HOOK ON 0V:HOOK OFF
+5V:HOOK ON EXT. Phone 0V:HOOK OFF EXT. Phone
+5V:CML ON 0V:CML OFF
+5V:RING OFF 0V:RING ON
0V:+24V TPH ON +24V:+24V TPH OFF
* UK:UNUSED
* UK:R76 → 300Ω R32 → 300Ω C63 → 334 R75 → UNUSED
FL1 USE
---:RX(RECEIVER)
---:TX(TRANSMITTER)

10-2-2. LIU

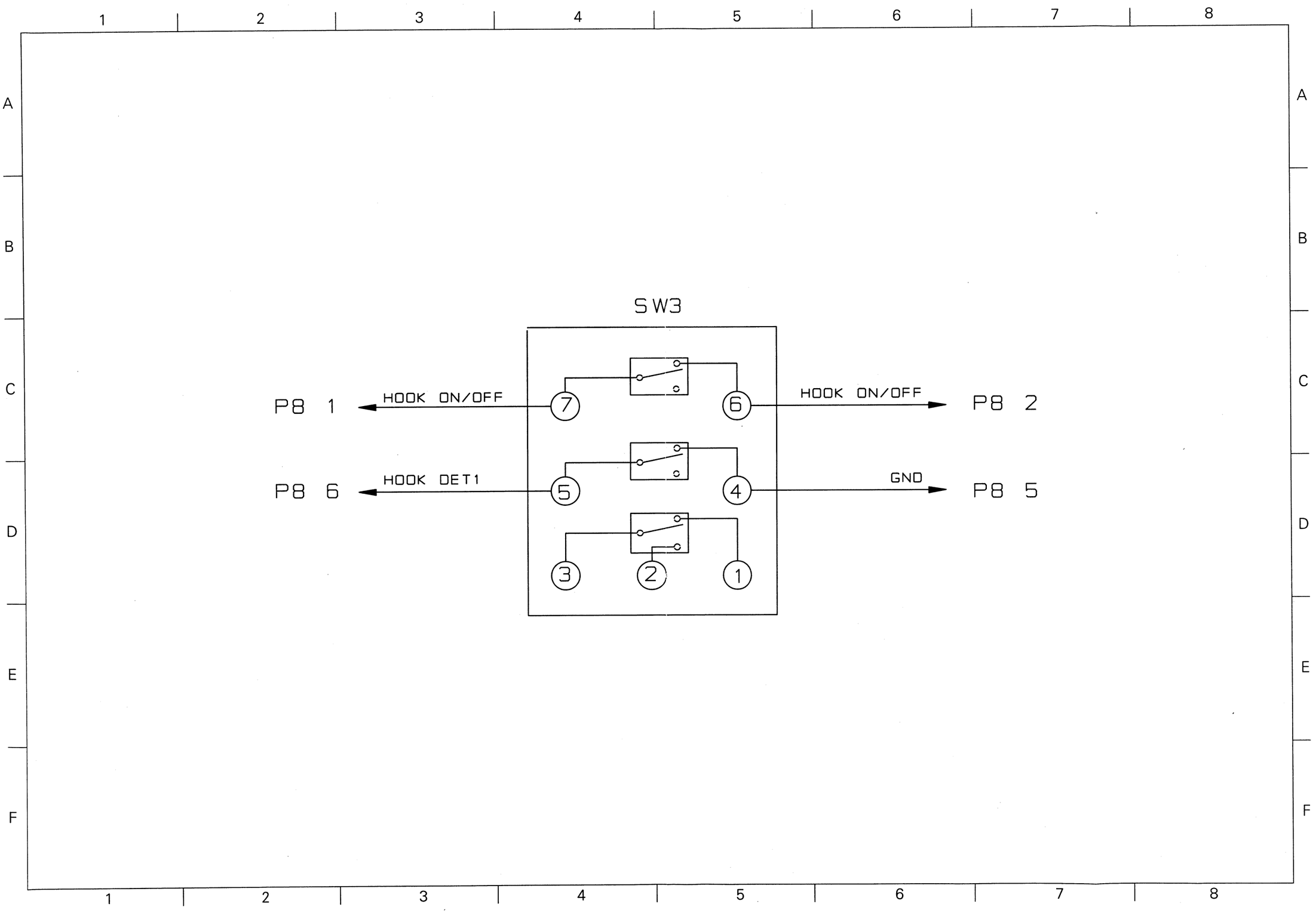

EXT PONE
MJ2 3
MJ2 4
MJ1 3
MJ1 4
LINE
FLT3
FLT4
FLT1
FLT2
FUS1
ARR2
ARR3
ARR1
P9 13
P9 12
P9 15
P9 14
P2 13
P2 12
P2 15
P2 14
P2 11
R44 82
C4 22UF 50V
R3 82
U7 PC814
/HOOK DET2
P1 8
* ZD1 - ZD4 : 1N4732A
C1 15NF 630V
T1 20K:20K
ZD1
ZD2
C2 102M
R1 30K
REMOTE
P1 7
GND12
U8-A LCA198
T2 600:470
ZD3
ZD4
C3 223M
MODEM
P1 6
K1-B CML G5V-2
+5
+24
GND12
GND5
P1 15
+24V P1 13
GND12 P1 1
P1 14
K1-A CML G5V-2
CML
P1 11
R50 680
U8-B LCA198
Q5 MPSA45
R51 10K
P1 9
P1 12
RING DET
U4 PC817
P2 5
C38 0.47UF
P2 6
BUZZER
P6 1
P6 2
P2 7
P9 5
P9 6
P9 7
C31 22UF 25V
R40 1.8K
U3 MC34012
C30 4.7UF
C40 102C
R41 180K
R42 56K
C29 1UF 250V
R39 6.2K 2.5W
P9 11
R30 8.2K
R43 120
SW1
DAUGHTER BOARD
P4 1 HOOK ON/OFF
P4 2 HOOK ON/OFF
HOOK
F2 1.2MH
F1 1.2MH
BD1 W06G
Q1 2SA1156
R16 C42 C16 R18
10K 103M 473 10K
R7 470K
VAR1 82V
D11 BAT47
C6 0.01UF 250V
R8 2.2M
Q2 MPSA45
R21 2.2M
R9 240K
C49 102C
D1 BAT47
R12 240K
R11 120K
ZD5 1N4742
R13 3.3K
C8 104C
R22 100K
Q3 MPSA45
C10 UNUSED
R14 820
R15 0
C41 102C
C11 22UF 16V
D2 BAT47
C15 100UF 16V
R24 100K
R17 5.6K
C17 102M
* D3-D10 : 1N4148
F3 5.6UH
F4 5.6UH
F5 5.6UH
F6 5.6UH
D3
D4
D5
D6
D7
D8
D9
D10
VR
C20 104C
C21 104C
R25 510
R26 510
HANDSET
P5 2 (RX)
P5 3
P5 1 (TX)
P5 4
U2 MC34114
VCC
VB
GND
VDD
MT
LR
RAGL
VR
MS
RXA
RXI
RXO1
RXO2
MC1
MC2
TXI
MCO
C18 473M
C19 102C
R27 47
R28 15
R32 20K
R33 20K
C39 103M
C36 22UF 16V
R5 20K
R19 UNUSED
R29 0
U1 K558503
M/B
HS
DP
X MUTE
VDD
VSS
TONE
OSCI
OSCO
MOS
C12 100UF 16V
C14 104C
ZD6 1N4731
R35 4.7K
R36 10K
C33 682M
C44 472M
Q4 MPSA45
C34 473M
R38 8.2K
R4 24K
R37 10K
X1 3.58MHZ
OPE
P3 1
P3 2
P3 3
P3 4
P3 5
P3 6
P3 7
C1
C2
C3
R1
R2
R3
R4
C22
C23
C24
C25
C26
C27
C28
* C22-C28 : 101C
HOOK BOARD
SW3-B
SW3-A
HOOK
P8 1 HOOK ON/OFF
P8 2 HOOK ON/OFF
P8 5 HOOK DET1
P8 6
HOOK
P4 5
P4 6
P4 7
P4 8
/HOOK DET1
P1 3
SPK OUT
P1 2
GND12
DAUGHTER BOARD
R31 10K
DP
SW2
MF
P9 9
P9 8
P9 10
P2 9
P2 8
P2 10
P9 2
P9 1
P9 3
P2 2
P2 1
P2 3
VOLUME OUT
P1 5
VOLUME IN
P1 4
VR1 20K
R6 5.6K
GND12


+5v
P16 12 +5V
P16 1 LED CTL
R12 470
Q1
KSC1623Y
R1 100
R2 100
R3 100
R4 100
LED1
LED2
LED3
LED4
POWER/
IN USE
ALARM
FINE
RCV. MODE
P16 2 OPO 0
P16 3 OPO 1
P16 4 OPO 2
P16 5 OPO 3
D1 TMPD914
D2 TMPD914
D3 TMPD914
D4 TMPD914
P16 6 OPI 0
P16 7 OPI 1
P16 9 OPI 2
P16 8 OPI 3
P16 10 GPIO 10/CLK1
U1-A
TC4053F
13
12
14
1
15
2
10 11
N1
N2
N3
N4
N5
N6
N7
N8
N9
N11
N10
N12
FUNC
SPEED
FLASH
RCV MODE
FINE
OHD
STOP
RD PAUSE
START
R5 30K
R6 30K
R7 30K
R8 30K
R9 30K
R10 30K
P16 13 GND 5
+5v
R11
200
P17 1
P17 2
GND5
P16 11 P-EMPTY
P17 3
P15 3 COL3
P15 2 COL2
P15 1 COL1
P15 4 ROW1
P15 5 ROW2
P15 6 ROW3
P15 7 ROW4
D5
TMPD914
16
U1-B
TC4053F
3 4 5 6 7 8 9

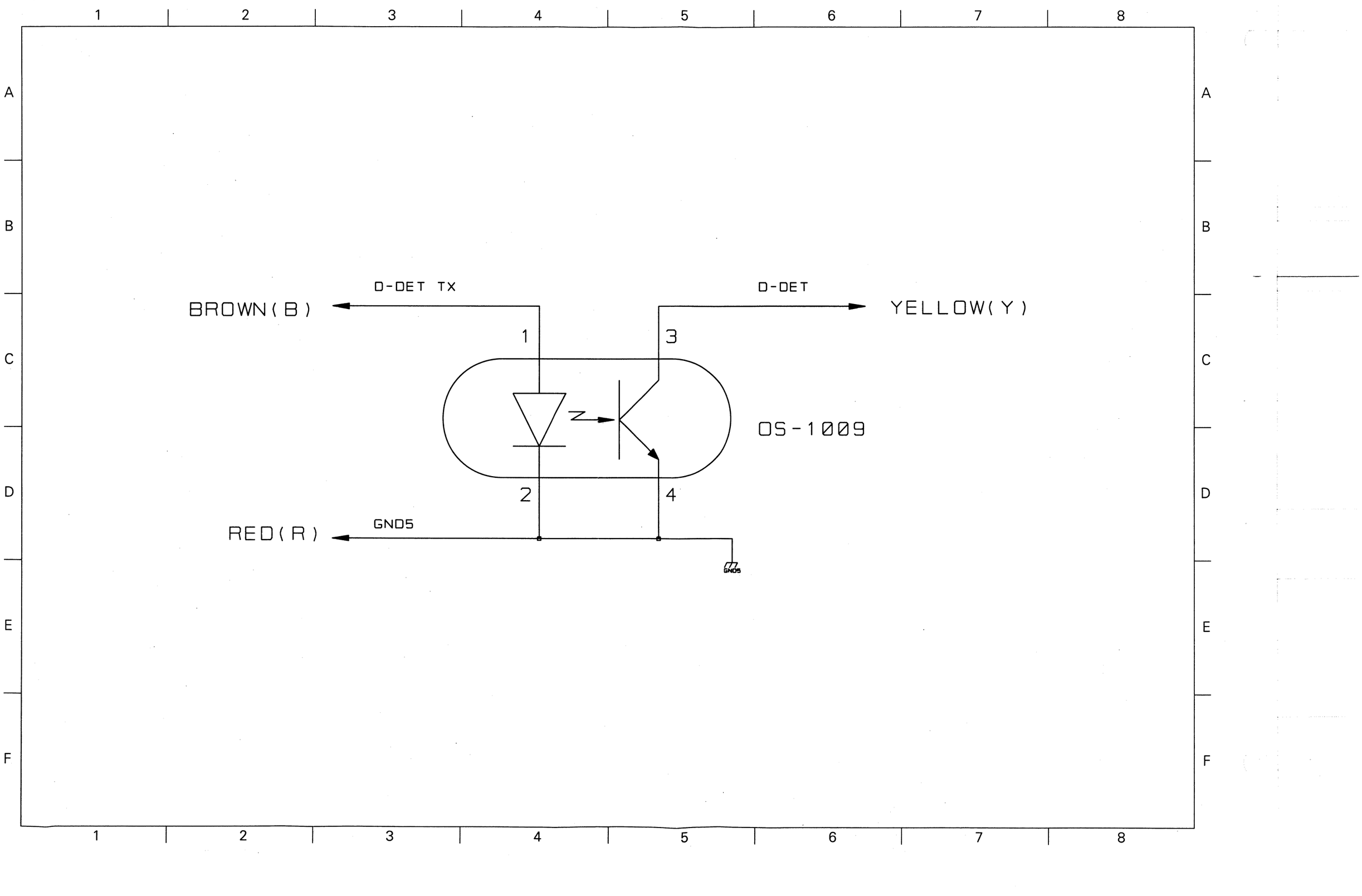
10-2-4. Daughter



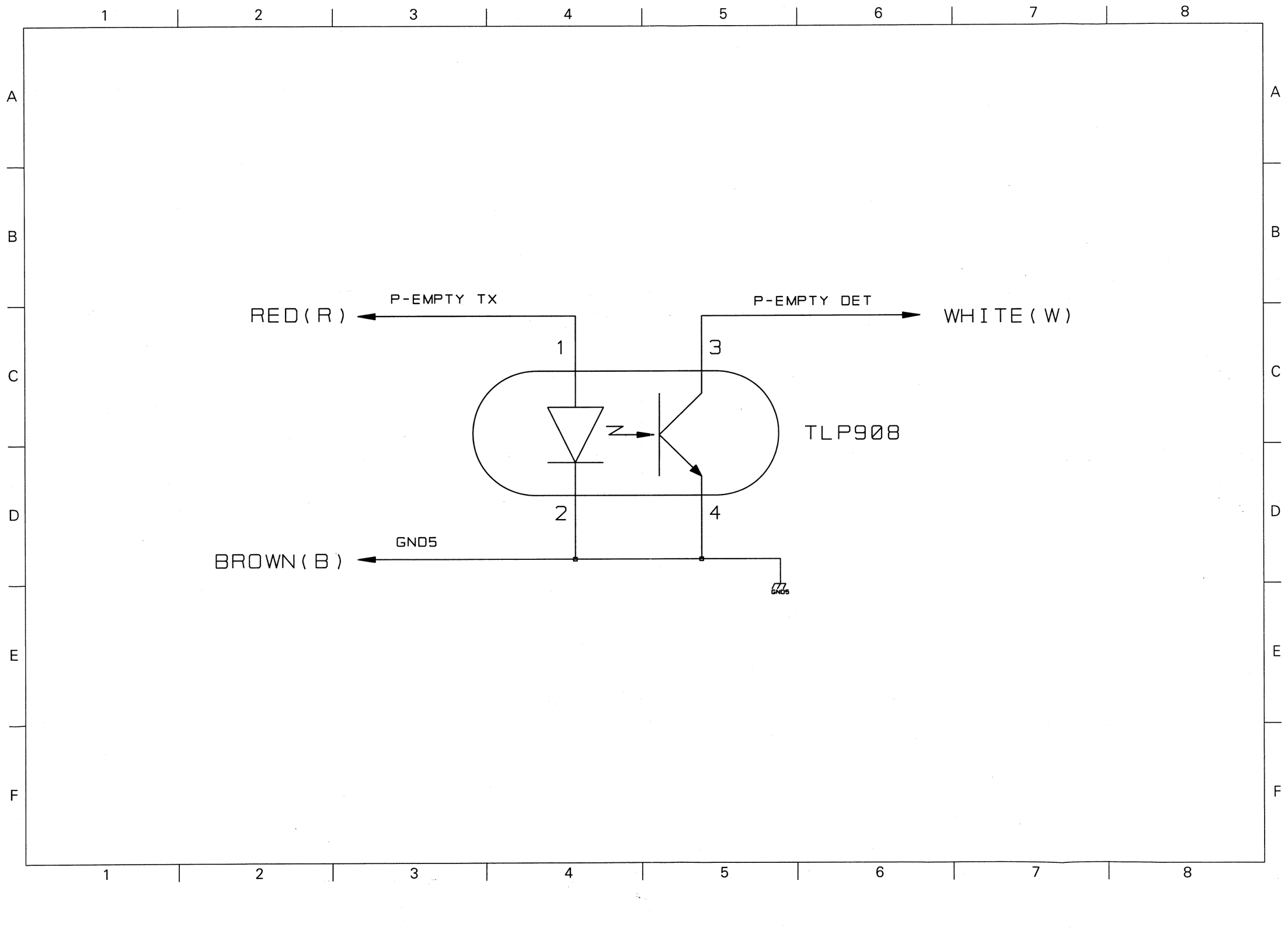
10-2-5. Hook


SW3
P8 1
HOOK ON/OFF
7
6
HOOK ON/OFF
P8 2
P8 6
HOOK DET1
5
4
GND
P8 5
3
2
1

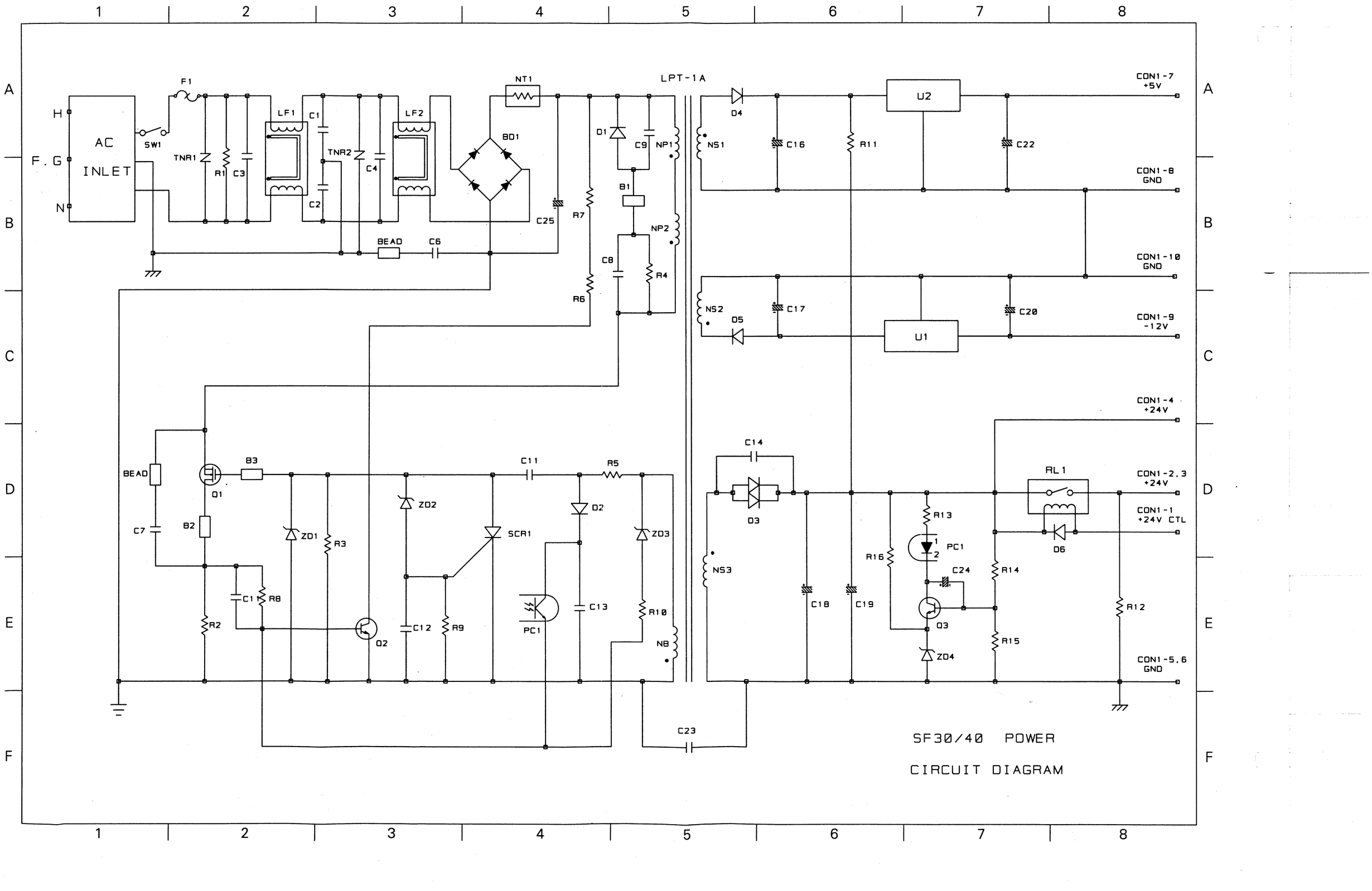
10-2-6. D-DET


1
2
3
4
5
6
7
8
A
B
C
D
E
F
D-DET TX
BROWN(B)
D-DET
YELLOW(Y)
1
3
OS-1009
2
4
RED(R)
GND5
GND5

10-2-7. P-Empty

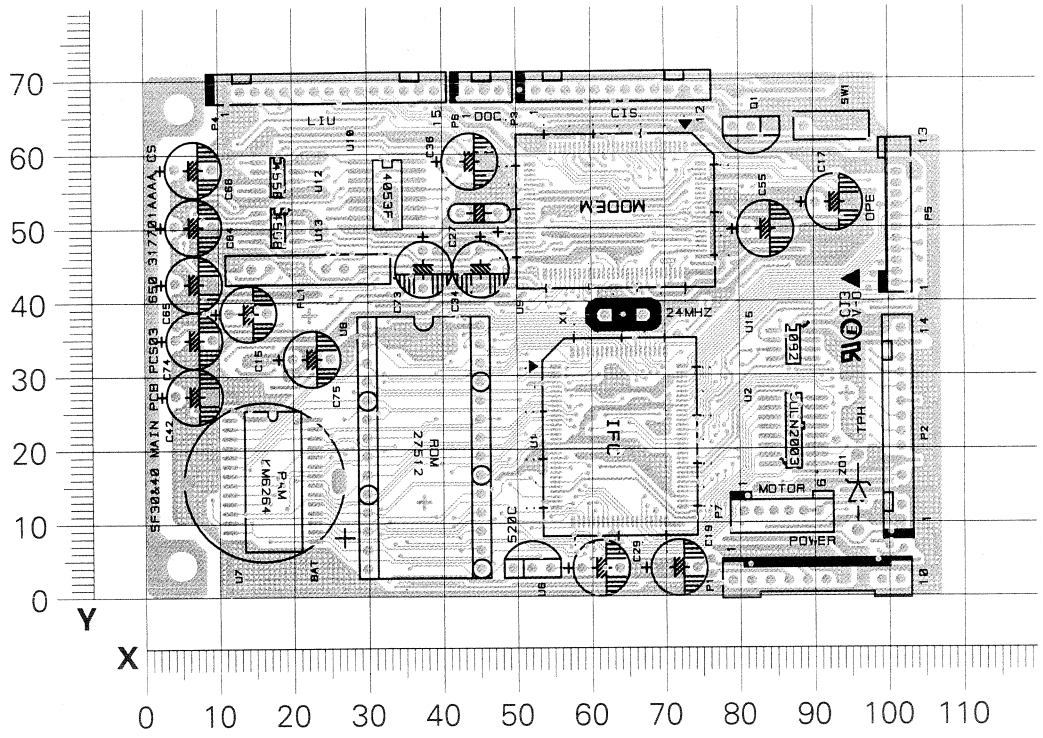

P-EMPTY TX
RED(R)
P-EMPTY DET
WHITE(W)
1
3
TLP908
2
4
GND5
BROWN(B)
GND5

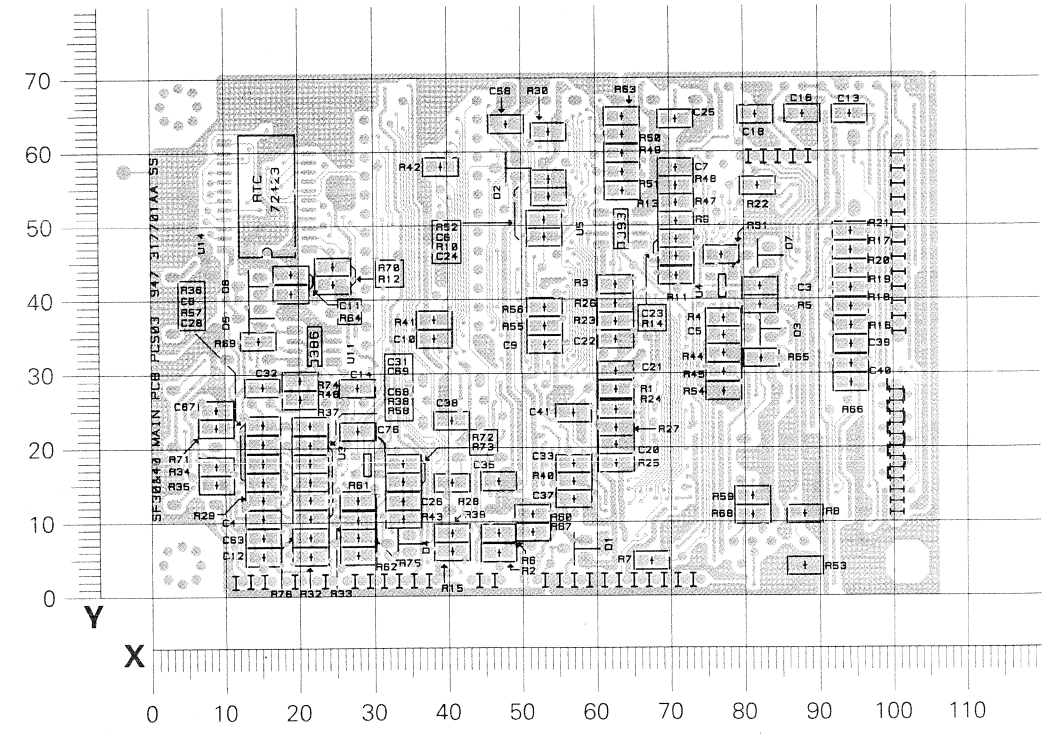
10-2-8. Power Supply



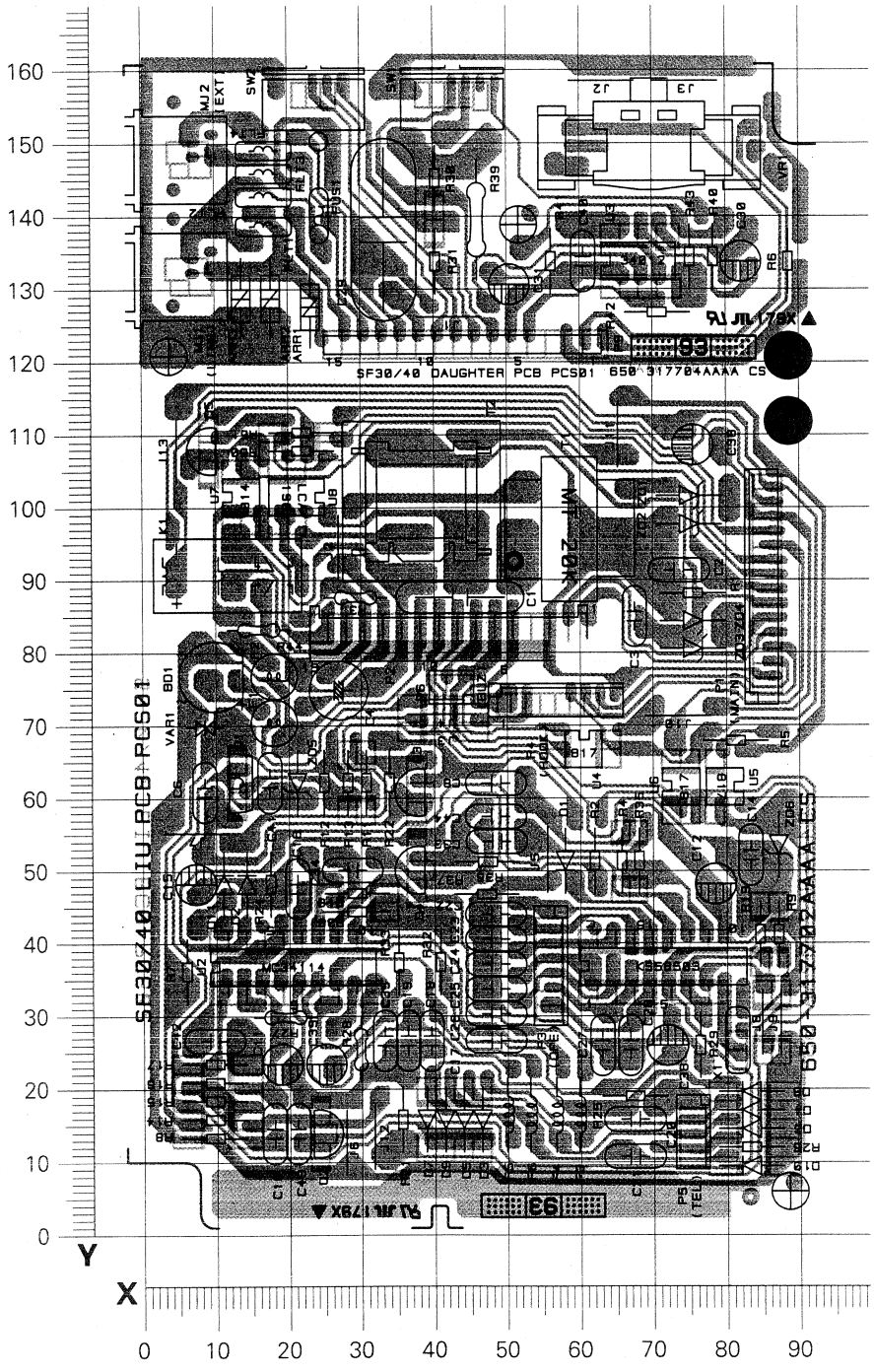
11. PCB Layout

11-1. Main PCB

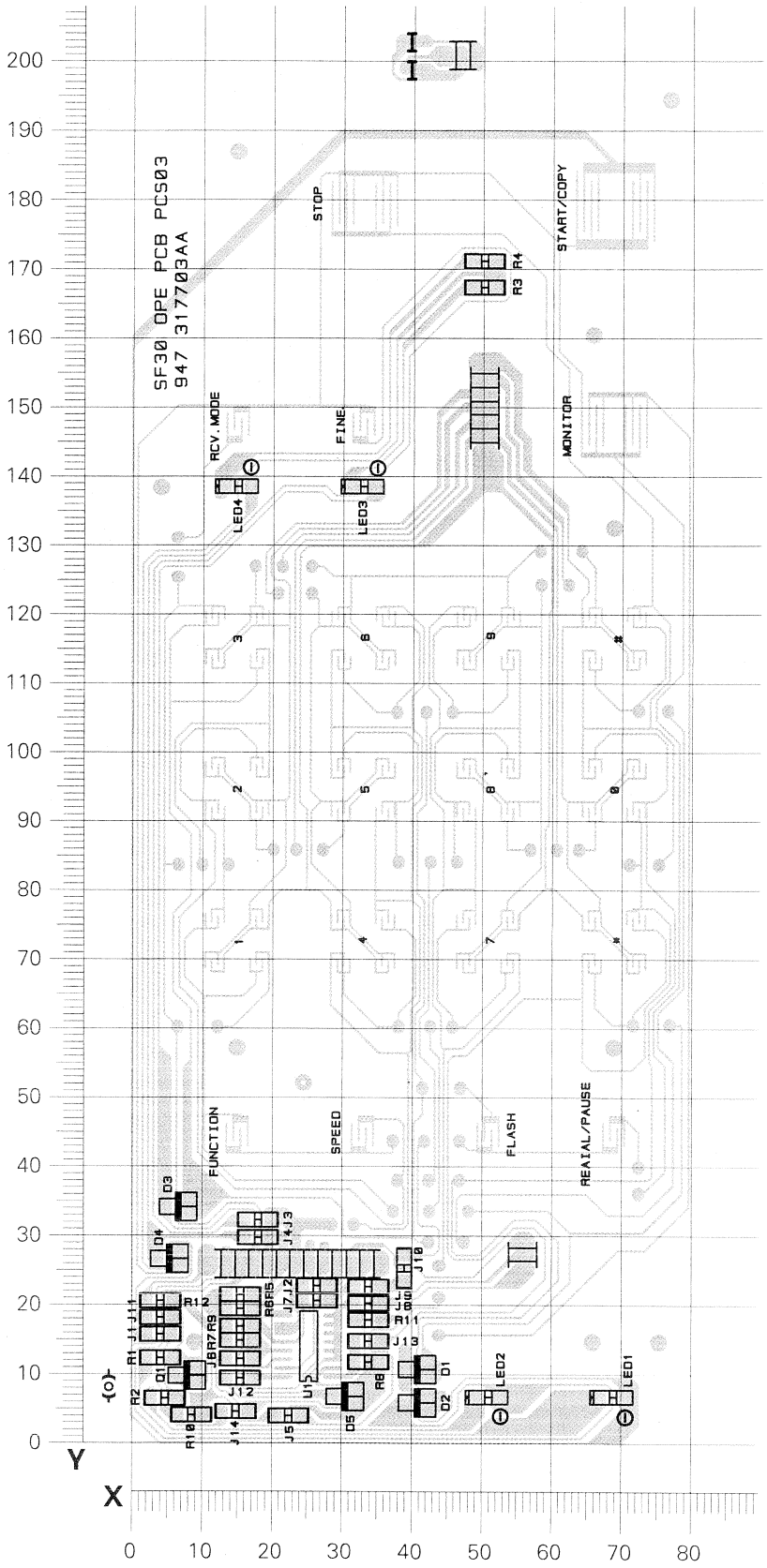




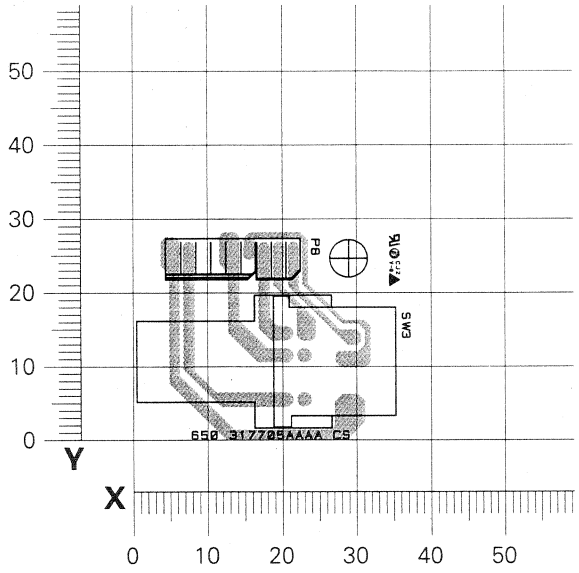
11-2. LIU PCB & Daughter PCB



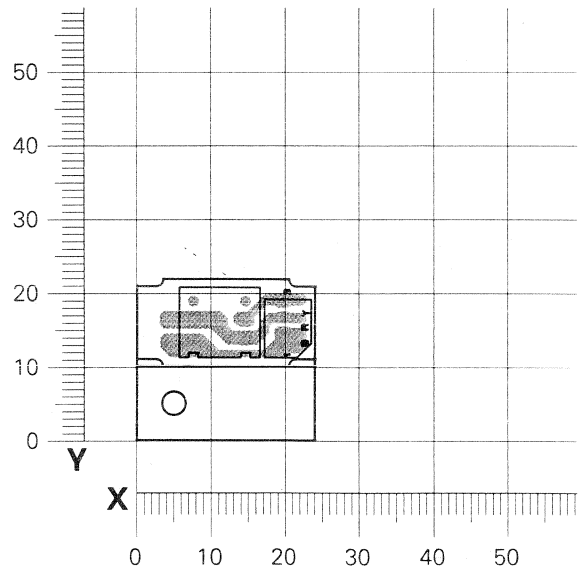
11-3. OPE PCB


SF30 OPE PCB PCS03
947 31770AA
STOP
START/COPY
RCV. MODE
FINE
MONITOR
LED4
LED3
FUNCTION
SPEED
FLASH
REAIAL/PAUSE
LED2
LED1
Y
X

11-4. Hook PCB

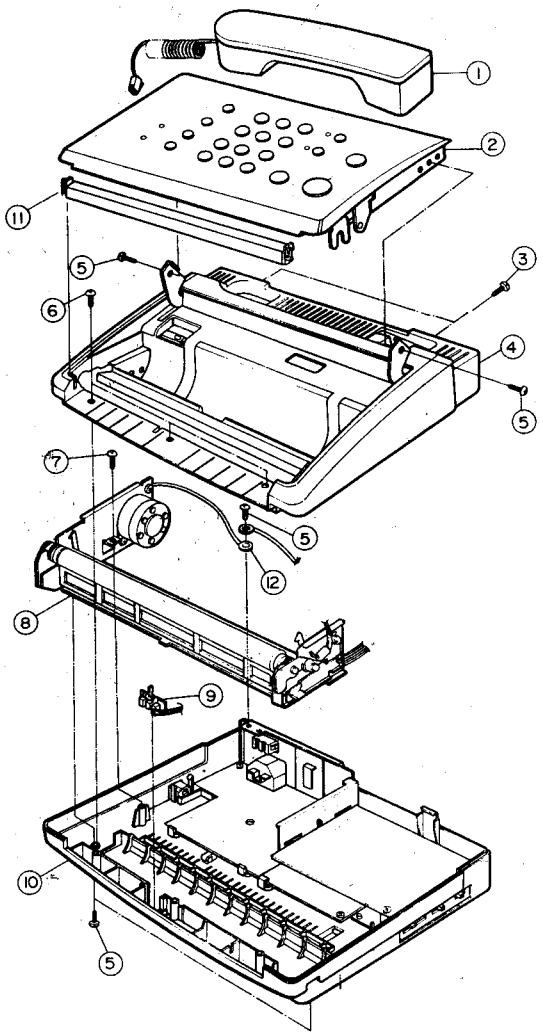


11-5. D-DET PCB



12. Exploded View & Mechanical Parts List

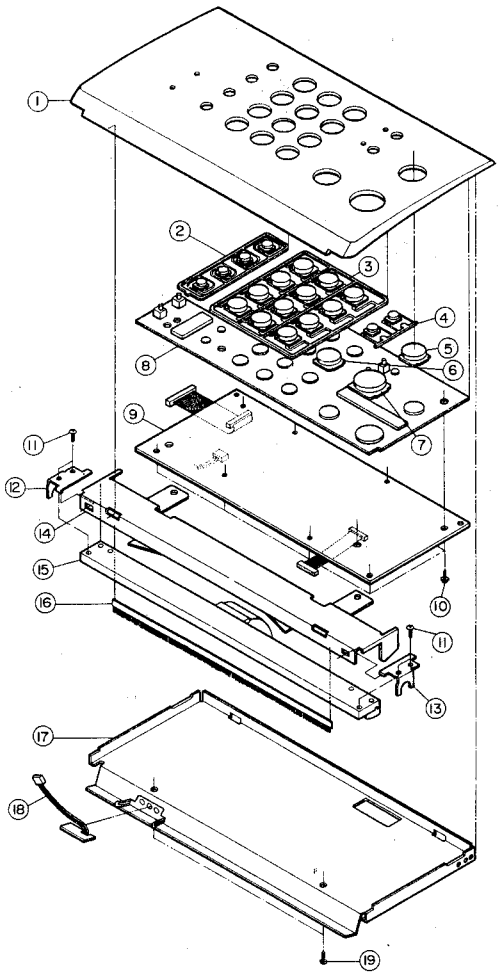
12-1. Main Assembly



Item No.	Description	Sec Code	Q'ty	Remarks
1	ASS'Y-HANDSET(BLACK) ASS'Y-HANDSET(IVORY)	139 - 750520AAAA 139 - 750520AAAC	1 1	
2	ASS'Y-OPE UNIT(BLACK) ASS'Y-OPE UNIT(IVORY)	139 - 770502BAAA 139 - 770502BABA	1 1	
3	SCREW,TAPTITE,S,BH,+,M3,L6(BLACK) SCREW,TAPTITE,S,BH,+,M3,L6(IVORY)	847 - 501007EH 847 - 501007DC	2 2	
4	ASS'Y-TOP COVER(BLACK) ASS'Y-TOP COVER(IVORY)	139 - 770501BAAA 139 - 770501BABA	1 1	
5	SCREW,TAPTITE,S,BH,+,M3,L6	847 - 501007DC	5	
6	SCREW,TAPTITE,B,PH,+,M3,L10(BLACK) SCREW,TAPTITE,B,PH,+,M3,L10(IVORY)	847 - 501001AK 847 - 501001AC	3 3	
7	SCREW,TAPTITE,B,BH,+,M3,L10	847 - 501007DA	1	
8	ASS'Y-MAIN CHASSIS UNIT	139 - 7 70504AAAA	1	SNA
9	PWR-MOTOR EARTH	955 - 317712AAJZ	1	
10	ASS'Y-BASE UNIT(BLACK) ASS'Y-BASE UNIT(IVORY)	139 - 770503AAAA 139 - 770503AABA	1 1	SNA
11	GUIDE-TX(BLACK) GUIDE-TX(IVORY)	821 - 310811AA 821 - 310811BA	1 1	
12	TOP COVER EARTH	955 - 317714AAAC	1	

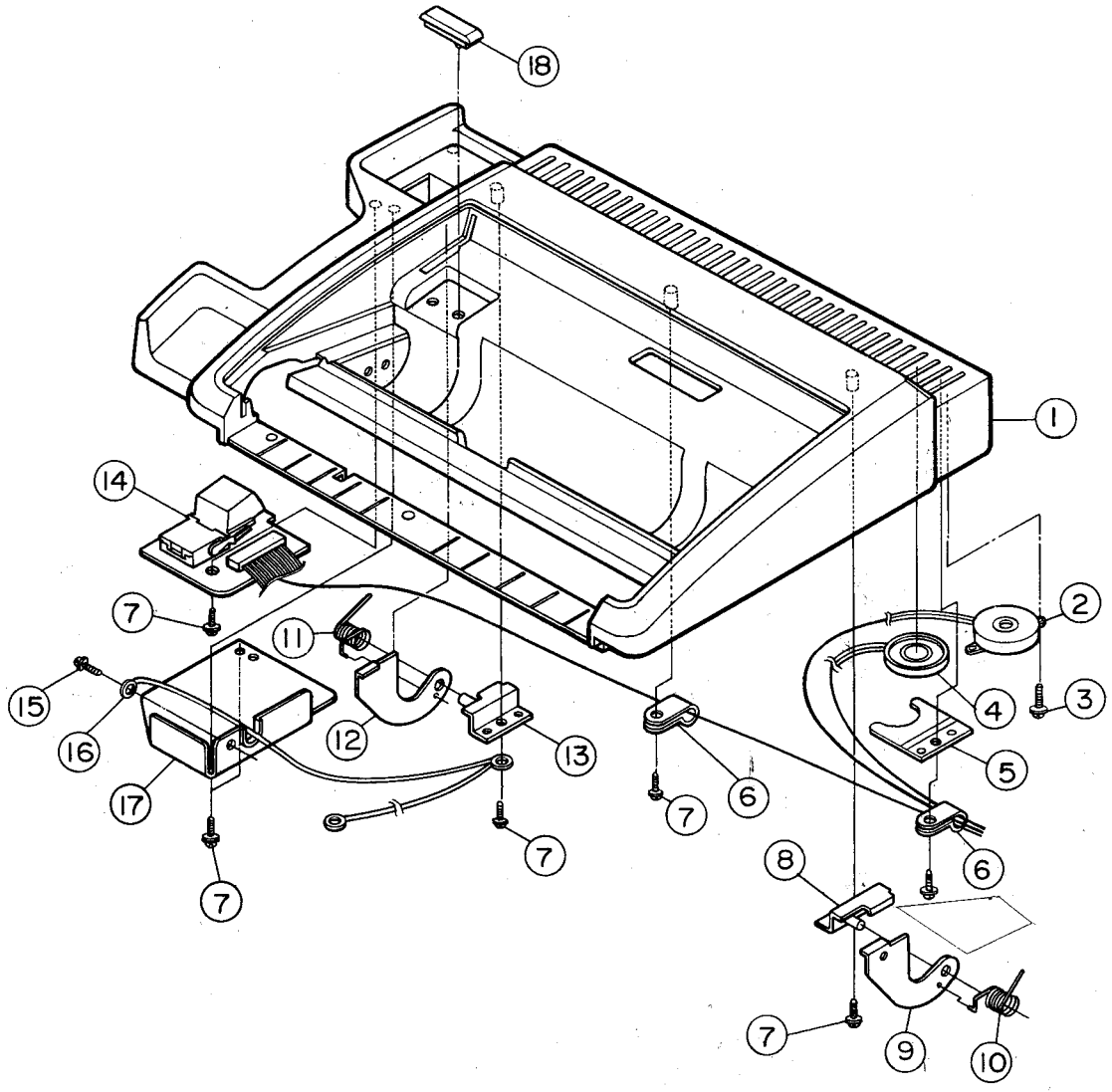
SNA: Service Not Available

12-2. Ass'y - OPE Unit



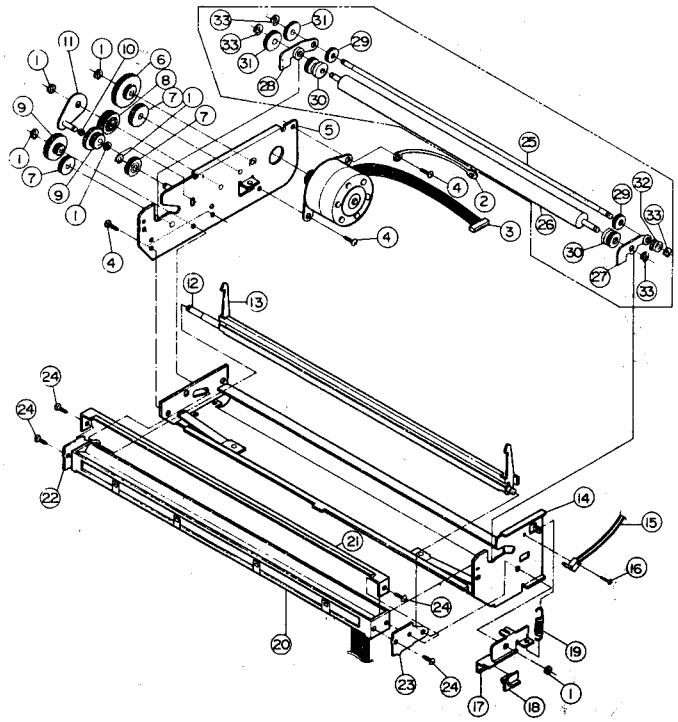
Item No.	Description	Sec Code	Q'ty	Remarks
1	COVER-OPE(BLACK)	821 - 310807AB	1	
	COVER-OPE(IVORY)	821 - 310807BB	1	
2	KEY-FUNCTION(4)(BLACK)	821 - 310955AA	1	
	KEY-FUNCTION(4)(IVORY)	821 - 310955BA	1	
3	KEY-TEL(3×4)(BLACK)	821 - 310809AA	1	
	KEY-TEL(3×4)(IVORY)	821 - 310809BA	1	
4	KEY-FUNCTION(2)(BLACK)	821 - 310956AA	1	
	KEY-FUNCTION(2)(IVORY)	821 - 310956BA	1	
5	KEY-STOP(BLACK)	821 - 310652EC	1	
	KEY-STOP(IVORY)	821 - 310652AB	1	
6	KEY-OHD(BLACK)	821 - 310652EA	1	
	KEY-OHD(IVORY)	821 - 310652EB	1	
7	KEY-START(BLACK)	821 - 310653CB	1	
	KEY-START(IVORY)	821 - 310653AB	1	
8	RUBBER-CONTACT	821 - 315169AA	1	
9	PBA, OPE	650 - 317703AAAA	1	SNA
10	SCREW,TAPTITE,B,PH,+,M2.5,L6	847 - 502001AL	8	
11	MACHINE,BH,+,M3,L4	841 - 613003BB	4	
12	GUIDE-TPH(L)	813 - 310277BA	1	
13	GUIDE-TPH(R)	813 - 310277AA	1	
14	BRKT-TPH UNIT	813 - 317045AA	1	
15	NMP,TPH,SEC TPH216	897 - 500017AA	1	
16	BRUSH-ANTISTATIC	811 - 311168AA	1	
17	CHASSIS-OPE UNIT	813 - 317047AA	1	
18	PBA-P EMPTY	650 - 317707AAAA	1	SNA
19	SCREW,TAPTITE,B,BH,+,M3,L10	847 - 501007DA	4	

12-3. Ass'y - Top Cover Unit



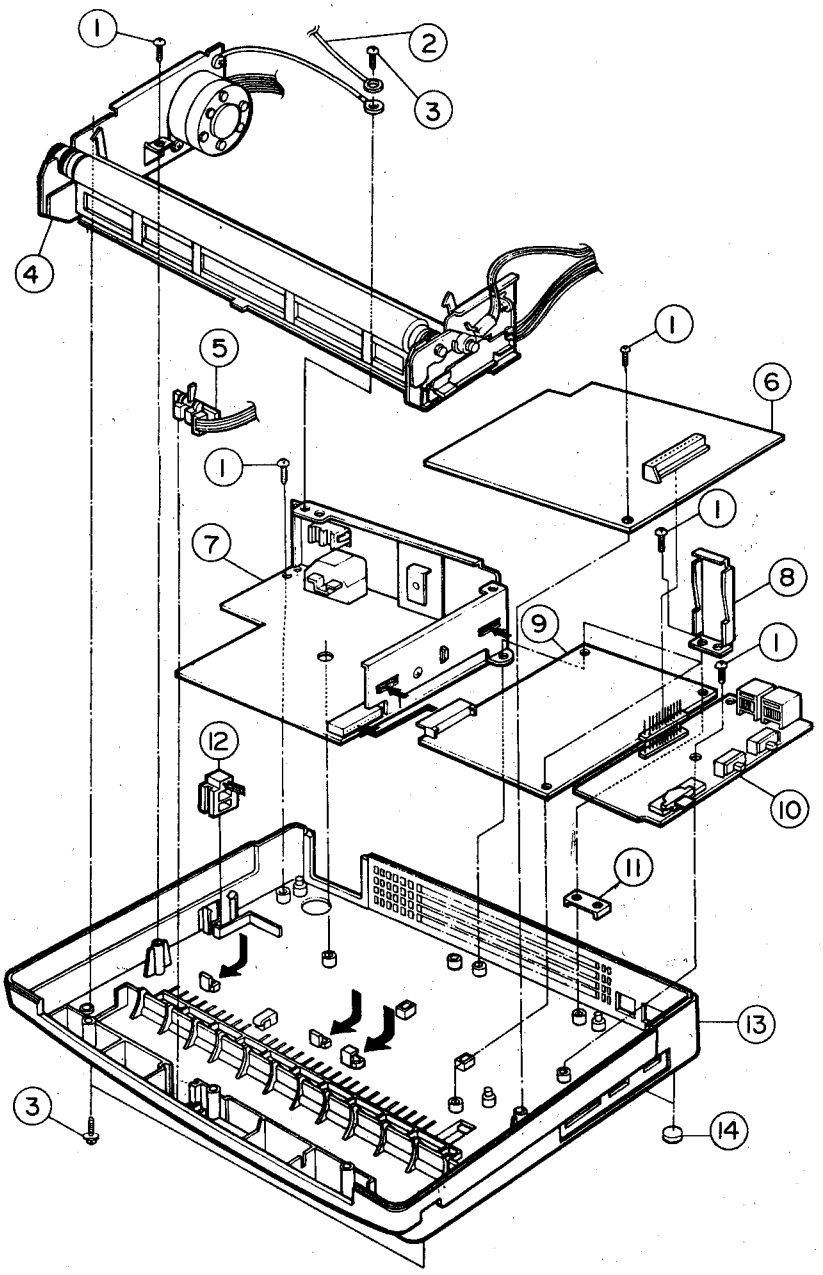
Item No.	Description	Sec Code	Q'ty	Remarks
1	COVER-TOP(BLACK)	821 - 310819AA	1	
	COVER-TOP(IVORY)	821 - 310819BA	1	
2	AUDIO-BUZZER,30,−,75	939 - 010004AD	1	
3	SCREW,TAPTITE,B,PH,+,M2.5,L6	847 - 502001AL	1	
4	AUDIO-SPEAKER,0.3W	939 - 040044AA	1	
5	BRKT-SPEAKER	813 - 310273AA	1	
6	MISCEL,CABLE CLAMP,DA-3N	857 - 170001AB	2	
7	SCREW,TAPTITE,B,BH,+,M3,L10	847 - 501007DA	7	
8	BRKT-HINGE(R)	813 - 310275AA	1	
9	HINGE-OPE(R)	813 - 310274AA	1	
10	SPRING-COVER(R)	813 - 315058AA	1	
11	SPRING-COVER(L)	813 - 315058BA	1	
12	HINGE-OPE(L)	813 - 310274BA	1	
13	BRKT-HINGE(L)	813 - 310275BA	1	
14	PBA,SF40 HOOK B'D(BLACK)	650 - 317705AAAB	1	SNA
	PBA,SF40 HOOK B'D(IVORY)	650 - 317705AABB	1	SNA
15	SCREW,TAPTITE,S,BH,+,M3,L4	847 - 501007EH	1	
16	TOP COVER-POWER	955 - 317714AAAC	1	
17	BRKT-CRADLE	813 - 310286AA	1	

12-4. Ass'y - Main Chassis Unit



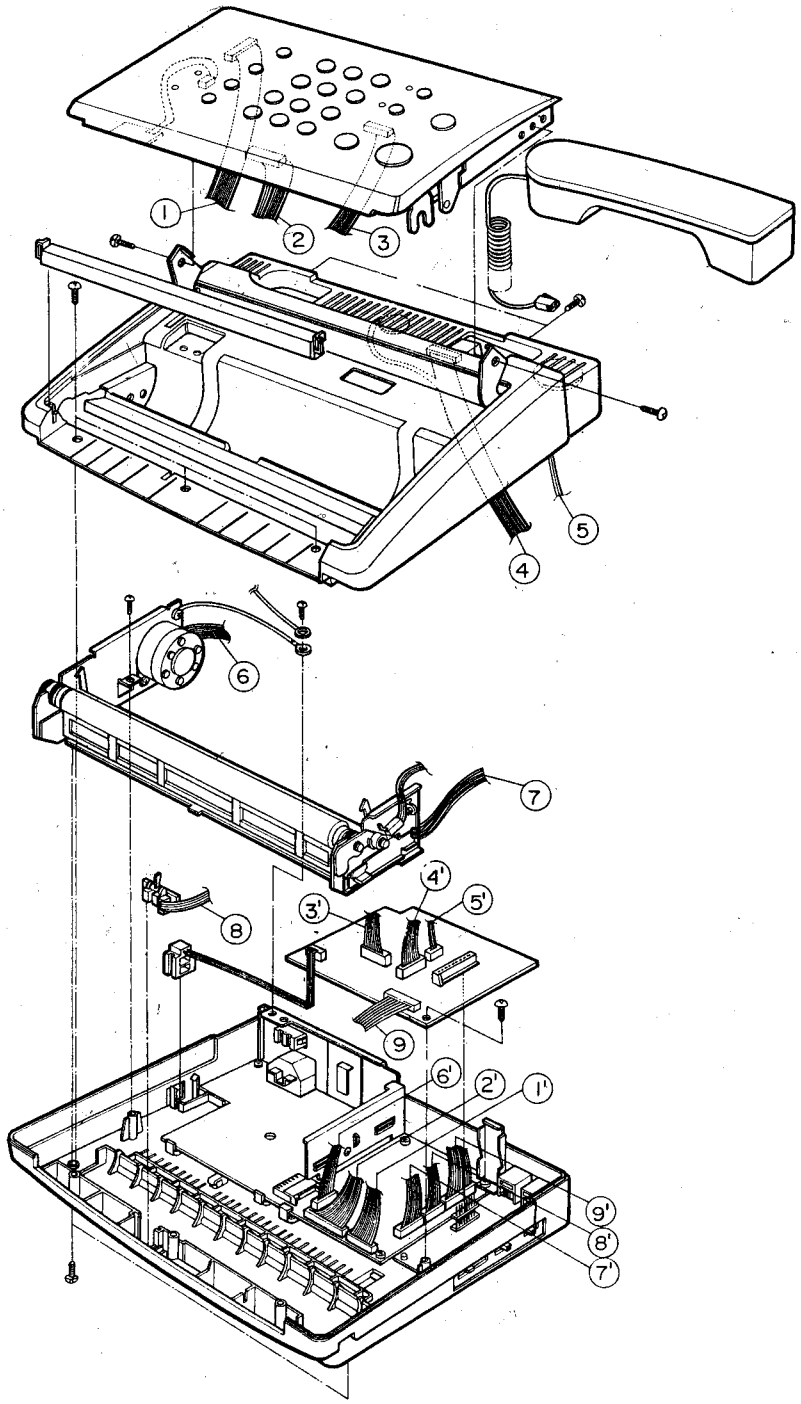
Item No.	Description	Sec Code	Q'ty	Remarks
1	MISCEL,RING E,#2.5	857 - 150014AB	6	
2	POWER-MOTOR EARTH	955 - 317712AAJZ	1	
3	MOTOR-STEP,24V,6P	953 - 280023HC	1	
4	SCREW,TAPTITE,S,BH,+,M3,L6	847 - 501007DC	4	
5	BRKT-REAR	813 - 310282AA	1	
6	GEAR-IDLER	821 - 310147AA	1	
7	GEAR-IDLE(B)	821 - 310542AA	3	
8	GEAR-IDLE(C)	821 - 310543AA	1	
9	GEAR-SWING	821 - 310817AA	2	
10	SPRING-GEAR	813 - 315059AA	1	
11	BRKT-SWING GEAR	813 - 310285AA	1	
12	SHAFT-LOCKER	813 - 314044AA	1	
13	LOCKER	813 - 310280AA	1	
14	CHASSIS-MAIN UNIT	813 - 317046AA	1	
15	SWITCH-MICRO LEVER	933 - 250055AA	1	
16	SCREW,TAPTITE,S,CH,+,M1.7,L7	847 - 506001DA	1	
17	IMP,LEVER-LOCKER	813 - 310281AA	1	
18	KNOB-LOCKER(BLACK) KNOB-LOCKER(IVORY)	821 - 310812AA 821 - 310812BA	1 1	
19	SPRING-CIS	813 - 315053AA	1	
20	CIS,DL100-14D	895 - 390011AB	1	
21	GUIDE-DOC	813 - 312115AA	1	
22	BRKT-CIS(L)	813 - 310284BA	1	
23	BRKT-CIS(R)	813 - 310284AA	1	
24	SCREW,TAPTITE,B,FH,+,M2,L6	847 - 506001CB	4	
25	SHAFT-CAM DRIVE	813 - 314045AA	1	
26	ROLLER-DRIVE	811 - 311167AA	1	
27	BUSHING-ROLLER(R)	821 - 310813AA	1	
28	BUSHING-ROLLER(L)	821 - 310813BA	1	
29	GEAR-CAM DRIVE	821 - 310814AA	2	
30	GEAR-CAM	821 - 310815AA	2	
31	GEAR-DRIVE	821 - 310816AA	2	
32	ACTUATOR-M.S	821 - 310818AA	1	
33	MISCEL,RING E,#3	857 - 150010AL	4	

12-5. Ass'y - Base Unit



Item No.	Description	Sec Code	Q'ty	Remarks
1	SCREW,TAPTITE,B,BH,+,M3,L10	847 - 501007DA	8	
2	TOP COVER POWER	955 - 317714AAAC	1	
3	SCREW,TAPTITE,S,BH,+,M3,L6	847 - 501007DC	3	
4	ASS'Y-MAIN CHASSIS	139 - 770504AAAA	1	SNA
5	PBA D.DET	650 - 317706AAAA	1	SNA
6	PBA LIU	650 - 317702AAAA	1	
7	MEP,P/S,AC/DC	953 - 140021MA	1	
8	BRKT-REAR	813 - 310279AA	1	
9	PBA MAIN	650 - 317701AAAA	1	
10	PBA DAUGHTER	650 - 317704AAAA	1	
11	SPRING-EARTH	813 - 312145AA	1	
12	LIU-HANDSET,250MM	955 - 317710AAAF	1	
13	BASE(BLACK) BASE(IVORY)	821 - 310808AA 821 - 310808BA	1 1	
14	FOOT-TU	821 - 272003AB	2	

12-6. Cable and Harness Assembly



Item No.	Description	Sec Code	Q'ty	Remark
1	MAIN-OPE,270mm	955 - 317701ACHZ	1	
2	MAIN-TPH,250mm	955 - 317704AAAF	1	
3	MAIN-OPE,200mm	955 - 317706AAAE	1	
4	LIU-HOOK,420mm	955 - 317713AECZ	1	
5	AUDIO-BUZZER,30,-,75	939 - 010004AD	1	
6	MOTOR-STEP,24V,6P	953 - 280023HC	1	
7	MAIN-CIS,120mm	955 - 317703AAAD	1	
8	MAIN-D.DET,310mm	955 - 317705ADBZ	1	
9	MAIN-LIU,150mm	955 - 317702AAAD	1	

13. Electrical Parts List

13-1. Electrical Parts List

	No.	Description	Part Name	Sec Code	Remark
⚠	ARR1	ARRESTER	DSS-30IL-S00B	953 210503BC	
⚠	ARR2	ARRESTER	DSS-30IL-S00B	953 210503BC	
⚠	ARR3	ARRESTER	DSS-30IL-S00B	953 210503BC	
	C29	1uF/250V	MMT.2E,105K	916 537100QK	
	C30	4.7uF/25V	SRA25VB-4R7(M)	917 721470EM	
	C31	22uF/25V	SRA25VB-22(M)	917 722220EM	
	C40	CAP-MYLAR,102J	TY1HRB102K	916 164100HJ	
	FLT1	FILTER		925 317002AA	
	FLT2	FILTER		925 317002AA	
	FLT3	FILTER		925 317002AA	
	FLT4	FILTER		925 317002AA	
	FUS1	MICRO FUSE	T251.750	949 150002AE	
	J1	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
	J2	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
	J3	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
⚠	MJ1	MODULAR JACK	623PCB2-B-1	935 720019BD	
⚠	MJ2	MODULAR JACK	623PCB2-B-1	935 720019BD	
⚠	PCB	DAUGHTER PCB	DAUGHTER PCB	947 317704AA	
	P9	CONNECTOR, 14P	AK2-15PD8-2.54DSA	935 220214AC	
	R6	MR1/8W,5.6K,G	REF-MF,5.6K,2%,1/8	911 445606CA	
	R30	MR1/8W,8.2K,G	REF-MF,8.2K,2%,1/8	911 448207CA	
	R31	MR1/8W,10K,J	REF-MF,10K,5%,1/8W	911 451007CA	
⚠	R39	MR2W,6.2K,J	WRP2.5W,6.2K,J	911 646207KA	
	R40	MR1/8W,1.8K,G	REF-MF,1.8K,2%,1/8	911 441806CA	
	R41	MR1/8W,180K,J	REF-MF,180K,2%,1/8	911 461807CA	
	R42	MR1/8W,56K,J	REF-MF,56K,5%,1/8W	911 455607CA	
	R43	MR1/8W,120,J	REF-MF,120,5%,1/8W	911 431207CA	
	S1	SLIDE SWITCH	SBHA13B-06	933 290047AD	
	S2	SLIDE SWITCH	SBHA12B-06	933 290047AC	
	U3	RINGER IC	MC34012P-1	881 634012AA	
	VR1	SLIDE VOLUME	RS15H11AA01WA	913 252007AF	
⚠	COD	LINE CORD	LINE CORD	955 316014BACK	IVORY only
⚠	COD	CURL CORD	CURL CORD	955 250430PACN	IVORY only
⚠	COD	POWER CORD	POWER CORD	955 316013AACL	
⚠	COD	LINE CORD	LION CORD	955 316014GACK	BLACK only
⚠	COD	CURL CORD	CURL CORD	955 317611HDAZ	BLACK only
	HAR	WIRE HARNESS	LIU-HANDSET	955 317710AAAF	
	HAR	EARTH WIRE	POWER-MOTOR	955 317712AAJZ	
	HAR	WIRE HARNESS	MAIN-TPH	955 317704AAAF	
	HAR	EARTH WIRE	POWER-TOP COVER	955 317711AAAC	SF30 only
	HAR	WIRE HARNESS	MAIN-LIU	955 317702AAAD	
	HAR	WIRE HARNESS	MAIN-CIS	955 317703AAAD	
	HAR	WIRE HARNESS	POWER-MOTOR	955 317714AAAC	SF40 only
	TPH	TPH	D2-216-8T20L	897 500017AA	
	CIS	CIS	DL100-14D	895 390011AB	
⚠	PWR	POWER	LIONS-1	953 140021MA	
		MICRO SWITCH	MLS-3	933 250055AA	
		STEPPING MOTOR	PM35L-048-SYD3	953 280023HC	
		HANDSET ASS'Y(B)		139 750520AAAA	BLACK only
		HANDSET ASS'Y(I)		139 750520AAAC	IVORY only
		TUBE(1.5mm)		821 621017AM	
		RECORDING PAPER	A4/10M/0.5 INCH	829 310033AA	
		AUDIO BUZZER		939 010004AD	
	SW1	HOOK SWITCH	SPPY 3POLE WITHE	933 210071BA	IVORY only
	SW1	HOOK SWITCH	SPPY 3POLE BLACK	933 210071BD	BLACK only
	SPK	SPEAKER	29-8F	939 040044AA	
	HAR	WIRE HARNESS(SF30)	LIU-HOOK (SF30)	955 317707ABCZ	SF30 only
	HAR	WIRE HARNESS(SF40)	LIU-HOOK (SF40)	955 317713AECZ	SF40 only

	No.	Description	Part Name	Sec Code	Remark
⚠	PCB	HOOK PCB	41mm×30mm	947 317705AA	
	SEN1	D-DET SENSOR	OS-1009	895 610014AA	
	HAR	WIRE HARNESS	MAIN-D.DET	955 317705ADBZ	
⚠	PCB	D-DET PCB	24mm×10mm	947 317706AA	
	SEN	P-EMPTY SENSOR	TLP908(LB)	895 710003AB	
	HAR	WIRE HARNESS	OPE-P.EMPTY	955 317709AAJZ	
	PCB	P-EMPTY PCB	P-EMPTY PCB	947 317707AA	
⚠	BD1	BRIDGE DIODE	W06G	893 390109AANB	
	C1	CAP-MPETP,153M	MMD153M630V-12.5P	916 565150WM	
	C2	CAP-MYLAR,102J	TY1HRB102K	916 164100HJ	
	C3	CAP-MYLAR,223K	TY1HRB223K	916 165220HK	
	C4	22uF/50V(NP)	SMBP50VB-22(M)	917 222220HM	
	C6	CAP-CERAMIC,103Z	CK2H103Z10BS	915 325100VZ	
	C8	CAP-CERAMIC,104K	YV1H104ZE	915 336100HZ	
	C10	UNUSED	UNUSED	UNUSED	
	C11	22uF/16V	SRA16VB-22(M)	917 722220CM	
	C12	100uF/16V	CESSL1C101MAAT	917 713100CM	
	C14	CAP-CERAMIC,104K	YV1H104ZE	915 336100HZ	
	C15	100uF/16V	CESSL1C101MAAT	917 713100CM	
	C16	CAP-MYLAR,473K	TY1HRB473K	916 165470HK	
	C17	CAP-MYLAR,102J	TYHRB102K	916 164100HJ	
	C18	CAP-MYLAR,473K	TYHRB473K	916 165470HK	
	C19	CAP-CERAMIC,102J	SR215A102JAA/TR	915 164100HJXH	
	C20	CAP-CERAMIC,104K	YV1H104ZE	915 336100HZ	
	C21	CAP-CERAMIC,104K	YV1H104ZE	915 336100HZ	
	C22	CAP-CERAMIC,101K	YB1H101KB	915 323100HK	
	C23	CAP-CERAMIC,101K	YB1H101KB	915 323100HK	
	C24	CAP-CERAMIC,101K	YB1H101KB	915 323100HK	
	C25	CAP-CERAMIC,101K	YB1H101KB	915 323100HK	
	C26	CAP-CERAMIC,101K	YB1H101KB	915 323100HK	
	C27	CAP-CERAMIC,101K	YB1H101KB	915 323100HK	
	C28	CAP-CERAMIC,101K	YB1H101KB	915 323100HK	
	C33	CAP-MYLAR,682K	TY1HRB682K	916 164680HK	
	C34	CAP-MYLAR,473K	TY1HRB473K	916 165470HK	
	C35	UNUSED			
	C36	22uF/16V	CESSM1C220MAAT	917 722220CM	
	C38	0.47uF/50V	SESSM1HR47MAAT	917 710470HM	
	C39	CAP-MYLAR 103J	TY1HRB103J	916 165100HJ	
	C41	CAP-CERAMIC,102J	SR215A102JAA/TR	915 164100HJXH	
	C42	CAP-MYLAR,103J	TYHRB103J	916 165100HJ	
	C44	CAP-MYLAR,472K,1H	TY1HRB472K	916 164470HK	
	C49	CAP-CERAMIC,102J	SR215A102JAA/TR	915 164100HJXH	
	D1	DIODE	BAT47	893 190103AA	
	D2	DIODE	BAT47	893 190103AA	
	D3	DIODE	1N4148	893 114148AA	
	D4	DIODE	1N4148	893 114148AA	
	D5	DIODE	1N4148	893 114148AA	
	D6	DIODE	1N4148	893 114148AA	
	D7	DIODE	1N4148	893 114148AA	
	D8	DIODE	1N4148	893 114148AA	
	D9	DIODE	1N4148	893 114148AA	
	D10	DIODE	1N4148	893 114148AA	
	D11	DIODE	BAT47	893 190103AA	
⚠	F1	INDUCTOR	1.2mH	925 310002AA	
⚠	F2	INDUCTOR	1.2mH	925 310002AA	
⚠	F3	INDUCTOR	5.6mH	925 120019BA	
⚠	F4	INDUCTOR	5.6mH	925 120019BA	
⚠	F5	INDUCTOR	5.6mH	925 120019BA	
⚠	F6	INDUCTOR	5.6mH	925 120019BA	
	J2	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
	J3	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
	J4	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
	J5	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	

	No.	Description	Part Name	Sec Code	Remark
	J6	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
	J7	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
	J8	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
	J9	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
	J10	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
	J11	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
	J12	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
	J13	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
⚠	K1	CML-RELAY	G5V-2 (24V)	927 300062CC	
	P1	CON-BOX HEADER, 15P	53015-1510	935 240515JA	
	P2	CON-SOCKET, 15P	MDF7-15S-2.54DSA	935 145115FB	
	P3	CON-BOX HEADER,7P	53014-710	935 240107JASA	
	P4	CON-BOX HEADER,8P	53014-810	935 240108JASA	
	P5	CON-BOX HEADER,4P	53014-410	935 240104JA	
	P6	CON-BOX HEADER,2P	GILS-2P-S2L2-EF	935 240902BE	
⚠	PCB	LIU PCB	947 317702AA		
	Q1	TR-PNP,2SA1156	2SA1156	891 241156AA	
	Q2	TR-NPN,MPSA45	MPSA45	891 390045AA	
	Q3	TR-NPN,MPSA45	MPSA45	891 390045AA	
	Q4	TR-NPN,MPSA45	MPSA45	891 390045AA	
	Q5	TR-NPN,MPSA45	MPSA45	891 390045AA	
	R1	MR1/8W,5.6K,J	REF-MF,5.6K,5%,1/8W	911 445606CA	
	R2	UNUSED			
	R3	MR1/4W,82,J	REF-MF,82,5%,1/4W	911 428207DA	
	R4	MR1/8W,24K,J	REF-MF,24K,5%,1/8W	911 452407CA	
	R5	MR1/8W,20K,J	REF-MF,20K,5%,1/8W	911 452007CA	
	R7	MR1/8W,470K,J	REF-MF,470K,5%,1/8	911 464707CA	
	R8	MR1/8W,2.2M,J	REF-MF,2.2M,5%,1/8	911 472207CA	
	R9	MR1/8W,240K,J	REF-MF,240K,5%,1/8	911 462407CA	
	R11	MR1/8W,120K,J	REF-MF,120K,5%,1/8	911 461207CA	
	R12	MR1/8W,240K,J	REF-MF,240K,5%,1/8	911 462407CA	
	R13	MR1/8W,3.3K,J	REF-MF,3.3K,5%,1.8	911 443307CA	
	R14	MR1/8W,820,J	REF-MF,820,5%,1/8W	911 438207CA	
	R15	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
	R16	MR1/8W,10K,J	REF-MF,10K,5%,1/8W	911 451007CA	
	R17	MR1/8W,5.6K,G	REF-NF,5.6K,2%,1/8	911 445606CA	
	R18	MR1/8W,10K,J	REF-MF,10K,5%,1/8	911 451007CA	
	R19	UNUSED			
	R21	MR1/8W,2.2M,J	REF-MF,2.2M,5%,1/8	911 472207CA	
	R22	MR1/8W,100K,J	REF-MF,100K,5%,1/8	911 461007CA	
	R24	MR1/8W,100K,J	REF-MF,100K,5%,1/8	911 461007CA	
	R25	MR1/8W,510,J	REF-MF,510,5%,1/8W	911 435107CA	
	R26	MR1/8W,510,J	REF-MF,510,5%,1/8W	911 435107CA	
	R27	MR1/4W,47,J	REF-MF,47,5%,1/4W	911 424707DA	
	R28	MR1/4W,15,J	REF-MF,15,5%,1/4W	911 121507DA	
	R29	JUMP WIRE	TCWA-0.6(BARE)	931 404701AA	
	R32	MR1/8W,20K,J	REF-MF,20K,5%,1/8W	911 452007CA	
	R33	MR1/8W,20K,J	REF-MF,20K,5%,1/8W	911 452007CA	
	R35	MR1/8W,4.7K,J	REF-MF,4.7K,5%,1/8	911 444707CA	
	R36	MR1/8W,10K,J	REF-MF,10K,5%,1/8W	911 451007CA	
	R37	MR1/8W,10K,J	REF-MF,10K,5%,1/8W	911 451007CA	
	R38	MR1/8W,8.2K,J	REF-MF,8.2K,5%,1/8	911 448207CA	
	R44	MR1/4W,82,J	REF-MF,82,5%,1/4W	911 428207DA	
	R50	MR1/8W,680,J	REF-MF,680,5%,1/8W	911 436807CA	
	R51	MR1/8W,10K,J	REF-MF,10K,5%,1/8W	911 451007CA	
⚠	T1	MATCHING TRANS	20K:20K	923 110564AA	
⚠	T2	MATCHING TRANS	600:470	923 310005AA	
	U1	DIALER IC	KS58503	881 658503AA	
	U2	SPEECH IC	MC34114	881 634114AA	
	U4	PHOTO COUPLE	PC817	895 530002AA	
	U5	PHOTO COUPLE	PC817	895 530002AA	
	U6	UNUSED			
⚠	U7	PHOTO COUPLE	PC814	895 520814AA	

	No.	Description	Part Name	Sec Code	Remark
⚠	U8	PHOTOMOS RELAY	LCA190	895 550002AA	
⚠	VAR1	VARI,82V,DISC	V82ZA2	897 130502BF	
	X1	C-RESO	3.58MG3100SS	941 210011GB	
	ZD1	ZENER-DIODE	1N4732A(4.7V)	893 214732AB	
	ZD2	ZENER-DIODE	1N4732A(4.7V)	893 214732AB	
	ZD3	ZENER-DIODE	1N4732A(4.7V)	893 214732AB	
	ZD4	ZENER-DIODE	1N4732A(4.7V)	893 214732AB	
	ZD5	ZENER-DIODE	1N4742(12V)	893 214742AB	
	ZD6	ZENER-DIODE	1N4731(4.3V)	893 214731ABNA	
⚠	BAT	BAT-LI.3V.210mA	CR-2032-1HF1	953 130008AD	
	C3	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C4	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C5	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C6	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C7	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C8	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C9	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C10	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C11	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C12	UNUSED	UNUSED	UNUSED	
	C13	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C14	CAP-0805,223J,1H	GRM40COG223J50PT	915 515220CKXH	
	C15	10uF/16V	SR16VB-10(M)	917 712100CM	
	C16	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C17	100uF/16V	SR16VB-100(M)	917 713100CM	
	C18	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C19	33uF/50V	SR50VB-33(M)	917 712330HM	
	C20	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C21	CAP-0805,180J,1H	GRM40COG180J50PT	915 412180HJXH	
	C22	CAP-0805,390J,1H	GRM40COG390J50PT	915 412390HJXH	
	C23	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C24	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C25	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C26	CAP-0805,473Z,1H	GRM40Y5V473Z50PT	915 515470HKXH	
	C27	1uF/25V TANTAL	TBB1E010KSS	917 311100EK	
	C28	CAP-0805,102J,1H	GRM40COG102J50PT	915 414100HJXH	
	C29	10uF/16V	SR16VB-10(M)	917 712100CM	
	C31	CAP-0805,102J,1H	GRM40COG102J50PT	915 414100HJXH	
	C32	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C33	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C34	10uF/16V	SR16VB-10(M)	917 712100CM	
	C35	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C36	22uF/25V	SRA25VB-22(M)	917 722220EM	
	C37	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C38	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C39	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C40	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C41	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C42	10uF/16V	SR16VB-10(M)	917 712100CM	
	C55	10uF/16V	SR16VB-10(M)	917 712100CM	
	C56	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C63	UNUSED	UNUSED	UNUSED	
	C64	100uF/16V	SR16VB-100(M)	917 713100CM	
	C65	10uF/16V	SR16VB-10(M)	917 712100CM	
	C66	100uF/16V	SR16VB-100(M)	917 713100CM	
	C67	CAP-0805,473Z,1H	GRM40Y5V473Z50PT	915 515470HKXH	
	C68	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C69	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	C73	0.47uF/50V	SR50VB-R47(M)	917 710470HM	
	C74	UNUSED	UNUSED	UNUSED	
	C75	UNUSED	UNUSED	UNUSED	
	C76	CAP-0805,104Z,1H	CM21Y5V104Z50VAT	915 516100HZ	
	D1	DIODE CHIP	1S226 TE85R	893 190226AA	

	No.	Description	Part Name	Sec Code	Remark
	D2	DIODE CHIP	1S226 TE85R	893 190226AA	
	D3	DIODE CHIP	TMPD914	893 310914AD	
	D4	DIODE CHIP	TMPD914	893 310914AD	
	D5	DIODE CHIP	TMPD914	893 310914AD	
	D6	DIODE CHIP	TMPD914	893 310914AD	
	D7	DIODE CHIP	TMPD914	893 310914AD	
	P1	CON-WALL HEADER	GILG-10P-S3L2-E	935 241310BA	
	P2	CON-BOX HEADER,14P	35303-1450	935 240114JASA	
	P3	CON-BOX HEADER,12P	35303-1250	935 240112JASA	
	P4	CON-BOX HEADER,15P	35303-1550	935 240115JASA	
	P5	CON-BOX HEADER,13P	GILY-13P-S15T2-EF	935 240113NB	
	P6	CON-BOX HEADER,3P	35303-1030	935 240103JA	
	P7	CON-WALL HEADER,6P	GILS-6P-S2T2-EF(S)	935 240906BESA	
⚠	PCB	MAIN PCB	MAIN PCB	947 317701AA	
	Q1	TR-NPN,KSC5019M	KSC5019M	891 395019AA	
	R1	R-CHIP 150/5%	RC2012J151CS	911 731507BS	
	R2	R-CHIP 200/5%	RC2012J201CS	911 732007BS	
	R3	R-CHIP 10K/5%	RC2012J103CS	911 751007BS	
	R4	R-CHIP 3K/5%	RC2012J302CS	911 743007BS	
	R5	R-CHIP 1K/5%	RC2012J102CS	911 741007BS	
	R6	R-CHIP 100K/5%	RC2012J104CS	911 761007BS	
	R7	R-CHIP 200/5%	RC2012J201CS	911 732007BS	
	R8	UNUSED	UNUSED	UNUSED	
	R9	R-CHIP 47K/5%	RC2012J473CS	911 754707BS	
	R10	R-CHIP 10K/5%	RC2012J103CS	911 751007BS	
	R11	R-CHIP 15K/5%	RC2012J153CS	911 751507BS	
	R12	R-CHIP 10K/5%	RC2012J103CS	911 751007BS	
	R13	R-CHIP 10K/5%	RC2012J103CS	911 751007BS	
	R14	R-CHIP 20K/5%	RC2012J153CS	911 752007BS	
	R15	R-CHIP 100K/5%	RC2012J104CS	911 761007BS	
	R16	R-CHIP 82/5%	RC2012J820CS	911 728207BS	
	R17	R-CHIP 82/5%	RC2012J820CS	911 728207BS	
	R18	R-CHIP 82/5%	RC2012J820CS	911 728207BS	
	R19	R-CHIP 82/5%	RC2012J820CS	911 728207BS	
	R20	R-CHIP 82/5%	RC2012J820CS	911 728207BS	
	R21	R-CHIP 82/5%	RC2012J820CS	911 728207BS	
	R22	R-CHIP 82/5%	RC2012J820CS	911 728207BS	
	R23	R-CHIP 150/5%	RC2012J151CS	911 731507BS	
	R24	R-CHIP 10K/5%	RC2012J103CS	911 751007BS	
	R25	R-CHIP 10K/5%	RC2012J103CS	911 751007BS	
	R26	R-CHIP 1K/5%	RC2012J102CS	911 741007BS	
	R27	R-CHIP 10K/5%	RC2012J103CS	911 751007BS	
	R28	R-CHIP 17.4K/1%	RC2012F1742CS	911 751745BS	
	R29	R-CHIP 86.6K/1%	RC2012F8662CS	911 758665BS	
	R30	R-CHIP 10K/5%	RC2012J103CS	911 751007BS	
	R31	R-CHIP 330K/5%	RC2012J334CS	911 763307BS	
	R32	R-CHIP 470/5%	RC2012J471CS	911 734707BS	
	R33	R-CHIP 300/5%	RC2012J301CS	911 733007BS	
	R34	R-CHIP 47K/5%	RC2012J473CS	911 754707BS	
	R35	RCHIP 39K/5%	RC2012J393CS	911 753907BS	
	R36	R-CHIP 118K/1%	RC2012F1183CS	911 761185BS	
	R37	R-CHIP 86.6K/1%	RC2012F8662CS	911 758665BS	
	R38	R-CHIP 3K/5%	RC2012J302CS	911 743007BS	
	R39	R-CHIP 20/5%	RC2012J200CS	911 722007BS	
	R40	R-CHIP 47.5K/1%	RC2012F4752CS	911 754755BS	
	R41	R-CHIP 470/5%	RC2012J471CS	911 734707BS	
	R42	R-CHIP 100K/5%	RC2012J104CS	911 761007BS	
	R43	UNUSED	UNUSED	UNUSED	
	R44	R-CHIP 7.5K/5%	RC2012J752CS	911 747507BS	
	R45	R-CHIP 13K/5%	RC2012J133CS	911 751307BS	
	R46	R-CHIP 10/5%	RC2012J100CS	911 721007BS	
	R47	R-CHIP 20K/5%	RC2012J203CS	911 752007BS	
	R48	R-CHIP 360K/5%	RC2012J364CS	911 763607BS	

	No.	Description	Part Name	Sec Code	Remark
	R49	R-CHIP 10K/5%	RC2012J103CS	911 751007BS	
	R50	R-CHIP 10K/5%	RC2012J103CS	911 751007BS	
	R51	R-CHIP 10K/5%	RC2012J103CS	911 751007BS	
	R52	R-CHIP 10K/5%	RC2012J103CS	911 751007BS	
	R55	R-CHIP 150/5%	RC2012J151CS	911 731507BS	
	R56	R-CHIP 150/5%	RC2012J151CS	911 731507BS	
	R57	R-CHIP 24K/5%	RC2012J243CS	911 752407BS	
	R58	R-CHIP 33K/5%	RC2012J333CS	911 753307BS	
	R59	R-CHIP 10K/5%	RC2012J103CS	911 751007BS	
	R60	UNUSED	UNUSED	UNUSED	
	R61	R-CHIP 27K/5%	RC2012J273CS	911 752707BS	
	R62	R-CHIP 43K/5%	RC2012J433CS	911 754307BS	
	R63	R-CHIP 10K/5%	RC2012J103CS	911 751007BS	
	R64	R-CHIP 510/5%	RC2012J511CS	911 735107BS	
	R65	R-CHIP 100K/5%	RC2012J104CS	911 761007BS	
	R66	R-CHIP 100K/5%	RC2012J104CS	911 761007BS	
	R67	R-CHIP 000/5%	RC2012J000CS	911 710007BS	
	R68	R-CHIP 300/5%	RC2012J301CS	911 733007BS	
	R69	R-CHIP 680/5%	RC2012J681CS	911 736807BS	
	R70	R-CHIP 510/5%	RC2012J511CS	911 735107BS	
	R71	R-CHIP 10/5%	RC2012J100CS	911 721007BS	
	R72	R-CHIP 000/5%	RC2012J000CS	911 710007BS	
	R73	R-CHIP 470K/5%	RC2012J474CS	911 764707BS	
	R74	R-CHIP 10/5%	RC2012J100CS	911 721007BS	
	R75	R-CHIP 000/5%	RC2012J000CS	911 710007BS	
	R76	R-CHIP 000/5%	RC2012J000CS	911 710007BS	
	SOK1	28PIN SOCKET	WSDTF28T	935 155128DC	
	SW1	UNUSEDED	UNUSED	UNUSED	
	U1	R96PFE(ENGINE)	R96PFE(ENGINE)	877 300096EA	
	U2	MOTOR-DRIVER IC	ULN2003L	881 802003GA	
	U3	ANALOG S/W	TC4S66F	873 200466XR	
	U4	ANALOG S/W	TC4S66F	873 200466XR	
	U5	COMPARATOR	LM393D	881 200393GA	
	U6	VOLTAGE DETECTOR	PST520C	881 200520TA	
	U7	SRAM 64K	KM6264ALG-10	883 106264GB	
	U8	IC-MEM,EPROM,27512	NMC27C512AQ-20	883 627512BB	
	U9	MODEM	R96DFXL	881 600096EA	
	U10	ANALOG SWITCH	MC14053BCP	873 404053GANB	
	U11	AUDIO AMP	LM386D	881 100386GA	
	U12	OP AMP	MC4558D	881 104558GA	
	U13	OP AMP	MC4558D	881 104558GA	
	U14	REAL TIME CLOCK	RTC-72423	877 372423GB	
	U15	OP AMP	TL082	881 100082GA	
	X1	24.00014M X-TAL	AT-51,24.00014MHz	941 110092BB	
	ZD1	ZENER DIODE	1N4733A	893 214733AB	
	D1	D-CHIP	TMPD914	893 310914AD	
	D2	D-CHIP	TMPD914	893 310914AD	
	D3	D-CHIP	TMPD914	893 310914AD	
	D4	D-CHIP	TMPD914	893 310914AD	
	D5	D-CHIP	TMPD914	893 310914AD	
	P16	WIRE HARNESS	MAIN-OPE	955 317701ACHZ	
	P15	WIRE HARNESS	LIU-OPE	955 317706AAAE	
	J1	R-CHIP	RC3216J000CS	911 710007CR	
	J2	R-CHIP	RC3216J000CS	911 710007CR	
	J3	R-CHIP	RC3216J000CS	911 710007CR	
	J4	R-CHIP	RC3216J000CS	911 710007CR	
	J5	R-CHIP	RC3216J000CS	911 710007CR	
	J6	R-CHIP	RC3216J000CS	911 710007CR	
	J7	R-CHIP	RC3216J000CS	911 710007CR	
	J8	R-CHIP	RC3216J000CS	911 710007CR	
	J9	R-CHIP	RC3216J000CS	911 710007CR	
	J10	R-CHIP	RC3216J000CS	911 710007CR	
	J11	R-CHIP	RC3216J000CS	911 710007CR	

	No.	Description	Part Name	Sec Code	Remark
	J12	R-CHIP	RC3216J000CS	911 710007CR	
	J13	R-CHIP	RC3216J000CS	911 710007CR	
	J14	R-CHIP	RC3216J000CS	911 710007CR	
	LED1	C-LED(RED)	BR1102W	895 190005RA	
	LED2	C-LED(GREEN)	PG1102W-TR	895 190005GA	
	LED3	C-LED(GREEN)	PG1102W-TR	895 190005GA	
	LED4	C-LED(GREEN)	PG1102W-TR	895 190005GA	
	P17	CON-BOX HEADER, 3P		935 240503JA	
	PCB	OPE PCB	OPE PCB	947 317703AA	
	R1	R-CHIP	RC3216J101CS	911 731007CR	
	R2	R-CHIP	RC3216J101CS	911 731007CR	
	R3	R-CHIP	RC3216J101CS	911 731007CR	
	R4	R-CHIP	RC3216J101CS	911 731007CR	
	R5	R-CHIP	RC3216J303CS	911 753007CR	
	R6	R-CHIP	RC3216J303CS	911 753007CR	
	R7	R-CHIP	RC3216J303CS	911 753007CR	
	R8	R-CHIP	RC3216J303CS	911 753007CR	
	R9	R-CHIP	RC3216J303CS	911 753007CR	
	R10	R-CHIP	RC3216J303CS	911 753007CR	
	R11	R-CHIP	RC3216J201CS	911 732007CR	
	R12	R-CHIP	RC3216J471CS	911 734707CR	
	Q1	TR-NPN,KTC2712	KSC1623-Y	891 391623AANA	
	U1	IC-MOS,4053	MC14053BCP	873 404053GANB	

13-2. Power Supply Unit C-List (SEC; SAMSUNG)

No.	Description	Part Name	Vender	Remark
BD1	DIODE-BRIDGE 600V 4A	RBV406 D3SB60	SANKEN SHINDNEGEN	
C1	C-CERAMIC(Y-CAP,UL)	HCYE2G222MAA CS13E2GA222MYAS	SAMSUNG TDK	
C2	C-CERAMIC(Y-CAP,UL)	HCYE2G222MAA CS13E2GA222MYAS	SAMSUNG TDK	
C3	C-FILM 125/250VAC 0.1uF	KNB1530-104M PBE2EA104K	ISKARA SEMCO	
C4	C-FILM 125/250VAC 0.1uF	KNB1530-104M PBE2EA104K	ISKARA SEMCO	
C6	C-CERAMIC(Y-CAP,UL)	HCYE2G222MAA CS13E2GA222MYAS	SAMSUNG TDK	
C7	C-CERAMIC1KV 680pF	HCYB3A681KDT	SAMSUNG	
C8	C-M.F630V 0.033uF	MMD630V333K	SHINSHIN	
C9	C-CERAMIC1KV 220pF	HCYB3A221KDT	SAMSUNG	
C10	C-MYLAR100V 0.033uF	CQ921MF2A333J	SEOJIN	
C11	C-MYLAR100V 0.033uF	CQ921MF2A333J	SEOJIN	
C12	C-MYLAR100V 0.022uF	CQ921MF2A22333J	SEOJIN	
C13	C-MYLAR100V 0.1uF	CQ921MF2A104J	SEOJIN	
C14	C-CERAMIC1KV 1000pF	HCYB3A102KDT	SAMSUNG	
C16	C-ELEC 1200uF-M-10V 10*25	STL1V102 SXE10V1200uF	SAMSUNG SAMYOUNG	
C17	C-ELEC 100uF-M-35V 8*12	ST35V 100uF SXE35V100uF	SAMSUNG SAMYOUNG	
C18	C-ELEC 330uF-M-35V 10*20	STL1V331 100uF SXE35V330uF(M)	SAMSUNG SAMYOUNG	
C19	C-ELEC 330uF-M-35V 10*20	STL1V331 100uF SXE35V330uF(M)	SAMSUNG SAMYOUNG	
C20	C-ELEC 47uF-M-25V 6.3*11	SS 25V 47uF SM25V47uF	SAMSUNG SAMYOUNG	
C22	C-ELEC 47uF-M-25V 6.3*11	SS 25V 47uF SM25V47uF	SAMSUNG SAMYOUNG	
C23	C-CERAMIC 400V 472M	HCYE2G472MAA CS17E2GA472MYAS	SAMSUNG TDK	
C24	C-ELEC 1uF-M-50V 5*11	SS 50V 1uF SM50V1uF	SAMSUNG SAMYOUNG	
C25	C-ELEC 330uF-M-200V 22*35	SMS2D331 SMS200V330uF	SAMSUNG SAMYOUNG	
D1	DIODE-TR 1KV 1A 75ns	BYV38 UF4007	TELEFUNKEN GI	
D2	DIODE-SW 75V 0.1A 40ns	1N4148 1N4148	TELEFUNKEN ROHM	
D3	DIODE-FR 200V 5A	D5LC20U	SHINDENGEN	
D4	DIODE-TR 200V 1A 50ns	D1NL20	SHINDENGEN	
D5	DIODE-TR 200V 1A 50ns	D1NL20	SHINDENGEN	
D6	DIODE-SW 75V 0.1A 40ns	1N4148 1N4148	TELEFUNKEN ROHM	
Q1	FET-POWER 500V 8A 0.85ohm	IRF840	SEC IR	
Q2	TRANSISTOR-NPN 60V 300mA	KSC1008-Y	SEC	
Q3	TRANSISTOR-NPN 60V 150mA	KSC945C-Y	SEC	
U1	IC-REGULATOR −12V 0.5A	KA79M12	SEC	
U2	IC-REGULATOR 5V 1.0A	KA7805	SEC	
SCR1	THYRISTOR 200V 0.8A	MCR100-4	MOTOROLA	
PC1	PHOTO-COUPLER 5KV 50mA	TLP621GB	TOSHIBA	
ZD1	DIODE-ZENER 0.5W 20V	MTZ20C 1N5250B	ROHM MOTOROLA	
ZD2	DIODE-ZENER 0.5W 20V	MTZ20C 1N5250B	ROHM MOTOROLA	
ZD3	DIODE-ZENER 0.5W 4.7V	MTZ4.7C 1N5230B	ROHM MOTOROLA	

No.	Description	Part Name	Vender	Remark
ZD4	DIODE-ZENER 0.5W 6.2V	MTZ6.2C 1N5234B	ROHM SGS-THOMSON	
R1	R-CARBON	1/4W-560K-J	HANJOO PHILIPS	
R2	R-WIRE WOUND	JRW1NO.1J 1W-0.1ohm-J	HANMI HANIL	
R3	R-CARBON	1/4W-27K-J	HANJOO PHILIPS	
R4	R-METAL OXIDE	1W-47K-J	YUMI PHILIPS	
R5	R-METAL OXIDE	1W-220K-J	YUMI PHILIPS	
R6	R-CARBON	1/4W-270K-J	HANJOO PHILIPS	
R7	R-CARBON	1/4W-200K-J	HANJOO PHILIPS	
R8	R-CARBON	1/4W-3K-J	HANJOO PHILIPS	
R9	R-CARBON	1/4W-27K-J	HANJOO PHILIPS	
R10	R-CARBON	1/4W-560-J	HANJOO PHILIPS	
R11	R-METAL OXIDE	2W-330-J	HANJOO PHILIPS	
R12	R-CARBON	1/4W-3.9K-J	HANJOO PHILIPS	
R13	R-CARBON	1/4W-220-J	HANJOO PHILIPS	
R14	R-CARBON	1/4W-6.8K-F	HANJOO PHILIPS	
R15	R-CARBON	1/4W-2.55K-F	HANJOO PHILIPS	
R16	R-CARBON	1/4W-2.2K-J	HANJOO PHILIPS	
LF1	LINE-FILTER	L0440	BOAM	
LF2	LINE-FILTER	L0440	BOAM	
LPT1A	TRANS-POWER EER28L	LIONS-V1	SOOJUNG SEOUL CLOVER TAEWON	
NT1	THERMISTOR	8D-13	ISHIZUKA	
TNR1	SURGE-ABSORBER	D6221ZOV301RA45	MAIDA	
TNR2	SURGE-ABSORBER	D69ZOV102RA220	MAIDA	
RL1	RELAY	VG24TM	TAKAMISAWA	
SW1	SWITCH ON/OFF F 1 FUSE CLIP(AUTO INSERT)	SF-W101A-03BB T8600VB FUSE 125VAC 3A (SB)	EDK ARCOLECTRIC 51S030L DONGWON	TRIAD
CN1	CONNECTOR 10PIN	GIL-D-10S-S3LA2-A	GSE	
PCB	POWER PCB		BAIKSAN CHEONGJU	
INLET	INLET INLET-PWR ASS'Y WIRE-RED ASS'Y CORE-TROIDAL	ACR303B10 EAC409 UL1007 20AWG R/B CORE(RING18,TC18) UL1015 22WAG RED RING18 TC18A	TSC SWICHARFT KYUNGSUNG SEOIL KYUNG SUNG SEOIL BOAM SAMSUNG	INLET SWITCH

13-3. Power Supply Unit C-List (DY; DONG YANG)

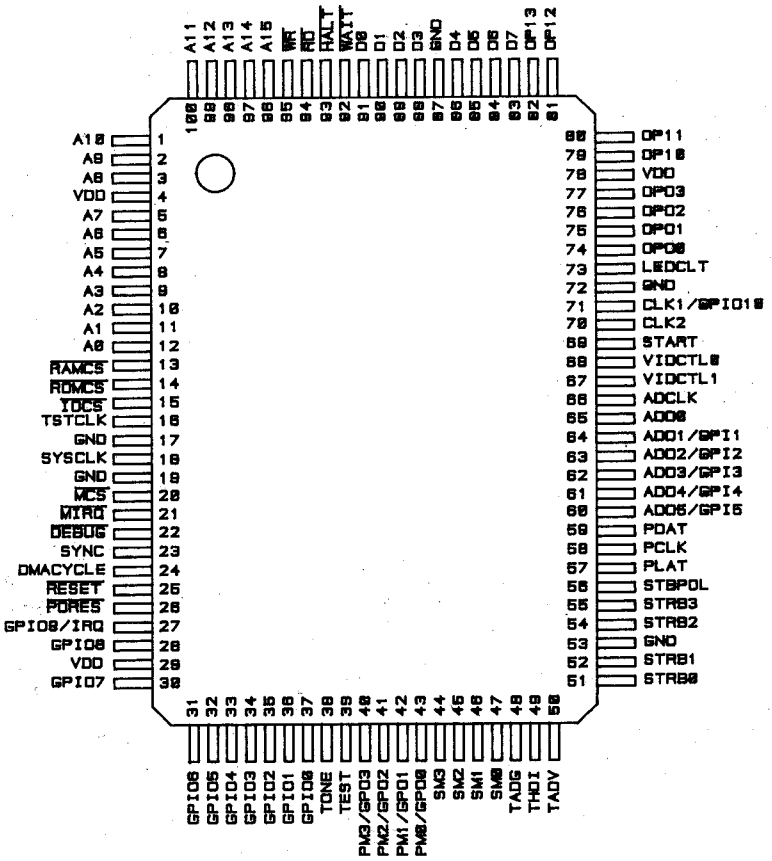
No.	Description	Part Name	Vender	Remark
BD1	DIODE-BRIDGE 600V 4A	RBV406 D3SB60	SANKEN SHINDNEGEN	
C1	C-CERAMIC(Y-CAP,UL)	CS13E2GA222MYAS HCYE2G222MAA DE7100F222MV1KC	TDK SAMSUNG MURADA	
C2	C-CERAMIC(Y-CAP,UL)	CS13E2GA222MYAS HCYE2G222MAA DE7100F222MV1KC	TDK SAMSUNG MURADA	
C3	C-FILM 125/250VAC 0.1uF	KNB1530-104 PBE2EA104K	ISKARA SEMCO	
C4	C-FILM 125/250VAC 0.1uF	KNB1530-104 PBE2EA104K	ISKARA SEMCO	
C6	C-CERAMIC(Y-CAP,UL)	HCYE2G222MAA CS13E2GA222MYAS DE7100F222MV1KC	SAMSUNG TDK MURADA	
C7	C-CERAMIC1KV 680pF	CKR3A681K08BS HCYB3A681KDT	SAMHWA SEMCO	
C8	C-M.F630V 0.033uF	MMW40CV 333K TM2G333K	DONGSUNG SAMHWA	
C9	C-CERAMIC1KV 220pF	CKR3A221KDT HCYB3A221KDT	SAMHWA SEMCO	
C10	C-MYLAR100V 0.033uF	TZ2A333J 310M2A333J	SAMHWA SUNIL	
C11	C-MYLAR100V 0.033uF	TZ2A333J 310M2A333J	SAMHWA SUNIL	
C12	C-MYLAR100V 0.022uF	TZ2A223J 310M2A223J	SAMHWA SUNIL	
C13	C-MYLAR100V 0.1uF	TZ2A104J 310M2A104J	SAMHWA SUNIL	
C14	C-CERAMIC1KV 1000pF	CKR3A102K10BS HCYB3A102KDT	SAMHWA SEMCO	
C16	C-ELEC 1200uF-M-10V	SXE10V1200UF(M) STL1A122	SAMUOUNG SEMCO	
C17	C-ELEC 100uF-M-35V	SXE35V100uF STL1V10101	SAMYOUNG SEMCO	
C18	C-ELEC 330uF-M-35V	SXE35V330uF(M) STL1V331 100uF	SAMYOUNG SEMCO	
C19	C-ELEC 330uF-M-35V	SXE35V330uF(M) STL1V331 100uF	SAMYOUNG SEMCO	
C20	C-ELEC 47uF-M-25V	SM25V47uF SS1E470	SAMYOUNG SEMCO	
C22	C-ELEC 47uF-M-25V	SM25V47uF SS1E470	SAMYOUNG SEMCO	
C23	C-CERAMIC 400V 472M	CS17E2GA472MYAS HCYE2G472MAA	TDK SAMSUNG	
C24	C-ELEC 1uF-M-50V	SM50V1uF SMS 50V 1uF	SAMYOUNG SEMCO	
C25	C-ELEC 330uF-M-200V	SMS200V330uF SMS2D331	SAMYOUNG SEMCO	
D1	DIODE-TR 1KV 1A 75ns	RG1C UF4007	SANKEN GI	
D2	DIODE-SW 75V 0.1A 40ns	1N4148 1N4148	ROHM TELEFUNKEN	
D3	DIODE-FR 200V 5A	D5LC20U S5KC20	SHINDENGEN SHINDENGEN	
D4	DIODE-TR 200V 1A 50ns	D1NL20	SHINDENGEN	
D5	DIODE-TR 200V 1A 50ns	D1NL20	SHINDENGEN	
D6	DIODE-SW 75V 0.1A 40ns	1N4148 1N4148	ROHM TELEFUNKEN	
Q1	FET-POWER 500V 8A 0.85ohm	IRF840 IRF840	SEC IR	

No.	Description	Part Name	Vender	Remark
Q2	TRANSISTOR-NPN 60V 300mA	KSC1008-Y	SEC	
Q3	TRANSISTOR-NPN 60V 150mA	KSC3198 (C1815Y) KSC945C-Y	KEC SEC	
U1	IC-REGULATOR −12V 0.5A	KA79M12CT MC79M12CT	SEC MOTOROLA	
U2	IC-REGULATOR 5V 1.0A	KA7805 CT MC7805 CT	SEC MOTOROLA	
SCR1	THYRISTOR 200V 0.8A	MCR100-4 TS0820-20	MOTOROLA S-T	
PC1	PHOTO-COUPLER 5KV 50mA	TLP621GB	TOSHIBA	
ZD1	DIODE-ZENER 0.5W 20V	MTZ20C UZ20BM	ROHM UNIZON	
ZD2	DIODE-ZENER 0.5W 20V	MTZ20C UZ20BM	ROHM UNIZON	
ZD3	DIODE-ZENER 0.5W 4.7V	MTZ4.7C UZ4,7B	ROHM UNIZON	
ZD4	DIODE-ZENER 0.5W 6.2V	MTZ6.2C UZ6.2BM	ROHM UNIZON	
R1	R-CARBON	1/4W-560K-J	PHILIPS S.Y	
R2	R-WIRE WOUND	JRW1NO.1J 1W-0.1ohm-J	HANMI HANIL	
R3	R-CARBON	1/4W-27K-J	PHILIPS S.Y	
R4	R-METAL OXIDE	1W-47K-J	PHILIPSI S.Y	
R5	R-METAL OXIDE	1W-220K-J	PHILIPS S.Y	
R6	R-CARBON	1/4W-270K-J	PHILIPS S.Y	
R7	R-CARBON	1/4W-200K-J	PHILIPS S.Y	
R8	R-CARBON	1/4W-3K-J	PHILIPS S.Y	
R9	R-CARBON	1/4W-27K-J	PHILIPS S.Y	
R10	R-CARBON	1/4W-560-J	PHILIPS S.Y	
R11				
R12	R-CARBON	1/4W-3.9K-J	PHILIPS S.Y	
R13	R-CARBON	1/4W-220-J	PHILIPS S.Y	
R14	R-CARBON	1/4W-6.8K-F	PHILIPS S.Y	
R15	R-CARBON	1/4W-2.55K-F	PHILIPS S.Y	
R16	R-CARBON	1/4W-2.2K-J	PHILIPS S.Y	
LF1	LINE-FILTER UU1116	L0440	BOAM KORYO	
LF2	LINE-FILTER UU1116	L0440	BOAM KORYO	
LPT-1A	TRANS-POWER EER28L	LIONS-V1	SONGWON KORYO	
FG	CORE TOROID	RING-18	BOAM SAMHWA	
CORE1	BEAD CORE	BFS3550R1F	SAMHWA BOAM	
CORE2	BEAD CORE	BFS3550R1F	SAMHWA BOAM	
CORE3	BEAD CORE	BFS3550R1F	SAMHWA BOAM	

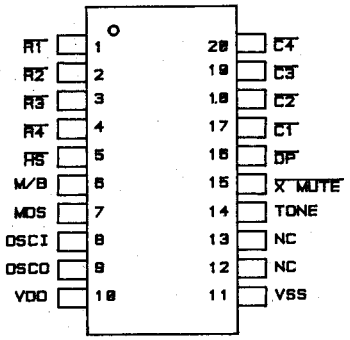
No.	Description	Part Name	Vender	Remark
CORE4	BEAD CORE	BFS-5050	SAMHWA BOAM	
CORE5	BEAD CORE	BFS-5050	SAMHWA BOAM	
NT1	THERMISTOR	KL09L010 08SP010	SANGSHIN UEI	
INLET	AC INLET 250V 6A	ACR303B10 EAC 409	TSC SWITCHCRAFT	
TNR1	SURGE-ABSORBER	TNR12G221 INR10D221K UL SVC220D-10A	MARCON ILJIN SAMHWA	
TNR2	SURGE-ABSORBER	TNR12G182K D69ZOV102RA220	MARCON MAIDA	
RL1	RELAY 5A 24VDC	VG24TM	TAKAMISAWA	
SW1	SWITCH ON/OFF	SF-W101A-03BB MSR5-2#3 T8600VB	EDK MARUSHIN ARCOLECTRIC	
F 1	FUSE CLASS FUSE CLIP	51SB030L 125V 3A 51S 125V 3A PBPS-H	TRIAD SAMHWA DONGIL	
CON1	CONNECTOR 10PIN	GIL-D-10S-S3LA2-A	GSE	
H,N	PC BOARD CRIMP	08-70-0166	MOLEX	
H,N	PC BOARD CRIMP	08-70-0166	MOLEX	
F.G	LEAD WIRE 0.22m GRN/YEL LEAD WIRE 0.2m RED LEAD WIRE 0.2m BLK	UL1015 #18 UL1007 #20 UL1007 #20	GOLDSTAR HANIL GOLDSTAR HANIL GOLDSTAR HANIL	

14. IC Lead Identification & Block Diagram

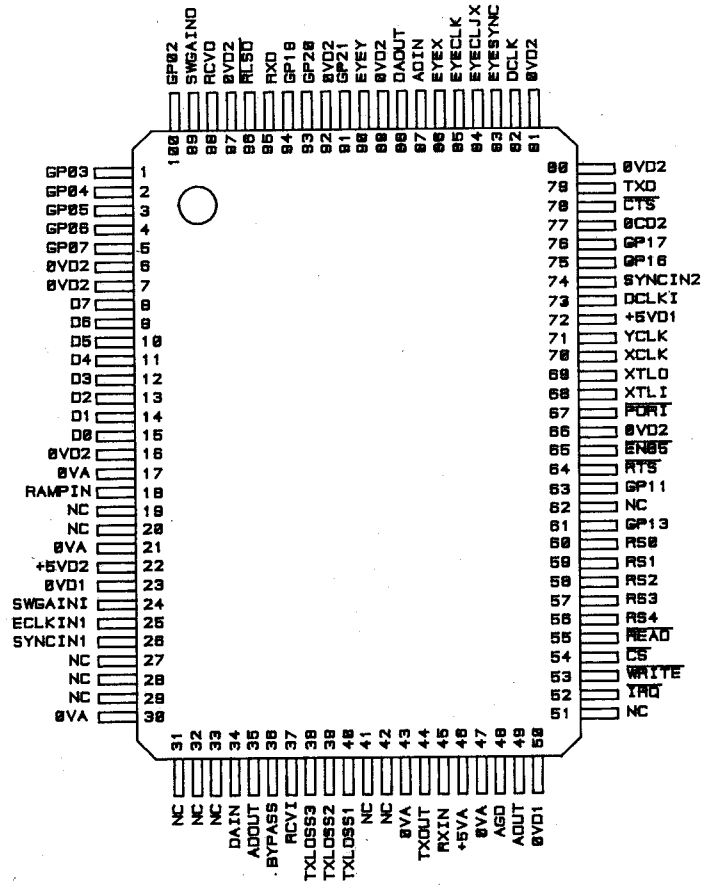
14-1. R96FE(IFC)



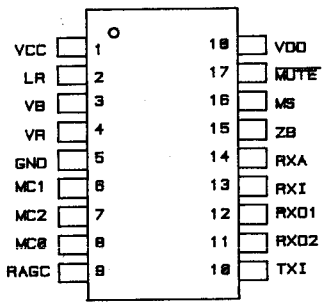
14-2. Modem R96DFXL



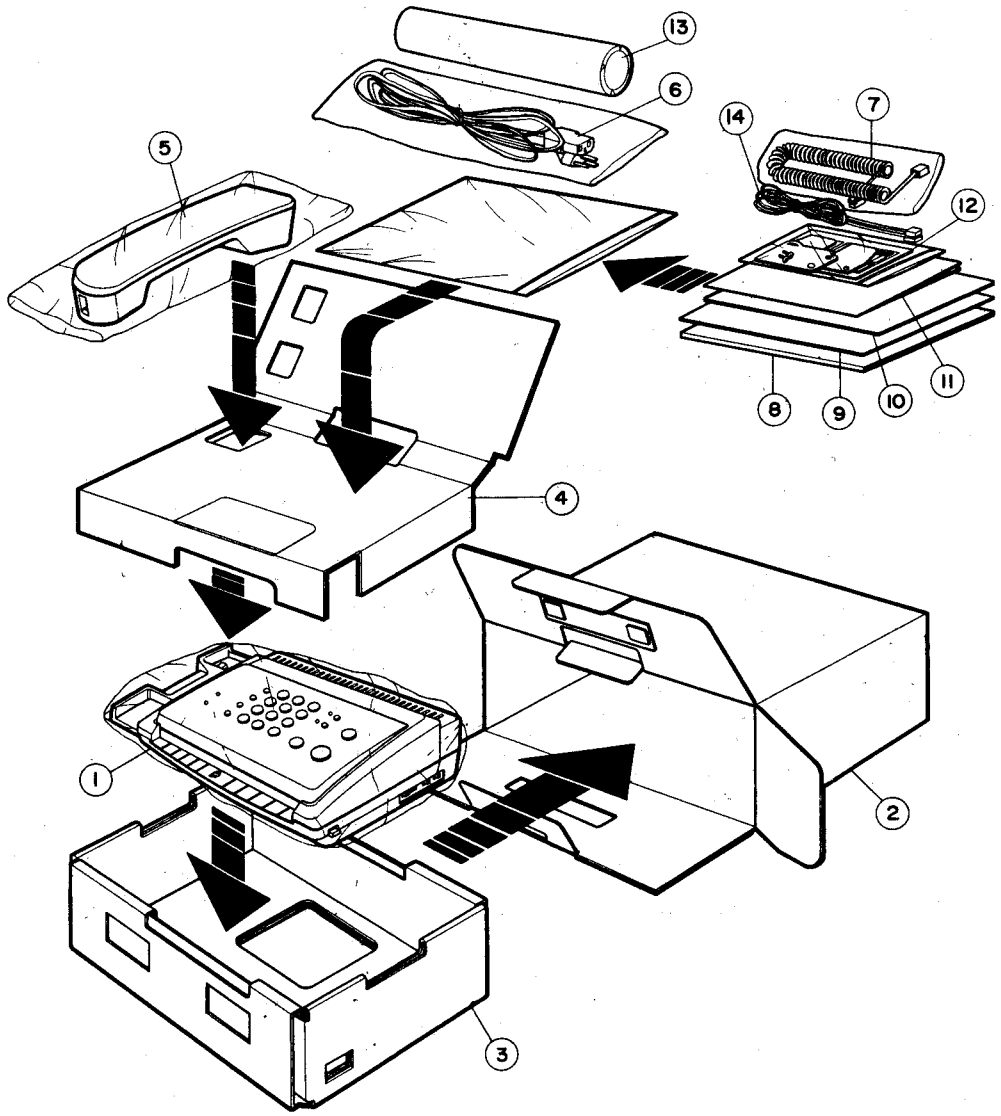
14-3. Diaier IC(KS58503)



14-4. Speech IC(MC34114)



15. Packing and Unpacking



Item No.	Description	Sec Code	Q'ty	Remarks
1	FAX UNIT		1	
2	UNIT BOX827 - 121001NB		1	
3	MASTER BOX	827 - 121002GB	1	
4	ACCESSORY BOX	827 - 121003GD	1	
5	ASS'Y-HANDSET(BLACK)	139 - 750520AAAA	1	
	ASS'Y-HANDSET(IVORY)	139 - 750520AAAC	1	
6	AC POWER CORD	955 - 316013AACL	1	
7	HANDSET CURL CORD(BLACK)	955 - 317611HDAZ	1	
	HANDSET CURL CORD(IVORY)	955 - 250430PACN	1	
8	OP MANUAL	139 - 900040EAAA	1	
9	CARD-ADDRESS	821 - 317163AA	1	
10	SHEET-GUIDE	821 - 317175AA	1	
11	CARD-800 SERVICE	825 - 110229AA	1	
12	MISCEL,D3,L5.5	857 - 110004AA	1	
13	THERMAL PAPER	829 - 310033AA	1	
14	TEL LINE CORD(BLACK)	955 - 316014GACK	1	
	TEL LINE CORD(IVORY)			